

OPTIONAL DETERMINATION OF NON-SIGNIFICANCE (DNS) NOTICE MATERIALS

The attached materials are being sent to you pursuant to the requirements for the Optional DNS Process (WAC 197-11-355). A DNS on the attached proposal is likely. This may be the only opportunity to comment on environmental impacts of the proposal. Mitigation measures from standard codes will apply. Project review may require mitigation regardless of whether an EIS is prepared. A copy of the subsequent threshold determination for this proposal may be obtained upon request.

File No.

Project Name/Address:

Planner:

Minimum Comment Period:

Materials included in this Notice:

Blue Bulletin Checklist Vicinity Map Plans Other:

OTHERS TO RECEIVE THIS DOCUMENT:

State Department of Fish and Wildlife State Department of Ecology, Shoreline Planner N.W. Region Army Corps of Engineers Attorney General Muckleshoot Indian Tribe

SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to <u>all parts of your proposal</u>, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals:

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the <u>SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D)</u>. Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [HELP]

- **1. Name of proposed project, if applicable**: King County Metro Bellevue Base Next Generation Wireless (NGW) Project
- 2. Name of applicant: King County Metro Transit (Metro)

3. Address and phone number of applicant and contact person: Lawrence Chung,

Metro Transit

Environmental Planner Phone (206) 263-5504 lachung@kingcounty.gov 201 South Jackson St., MS KSC-TR-0431

Seattle, WA 98104-3856

4. Date checklist prepared: 05/10/2021

5. Agency requesting checklist: City of Bellevue

6. Proposed timing or schedule (including phasing, if applicable):

The anticipated construction commencement date for this project is August 2021.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

The project is related to the King County Metro Bellevue Base Yard Lighting Replacement Project. The conduits constructed by this project will be shared and used by the Bellevue Base Yard Lighting Replacement Project. A separate SEPA Checklist will be submitted to assess the environmental impacts of the Bellevue Base Yard Lighting Replacement Project.

- 8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.
 - Critical Areas Report
 - Geotechnical Report for the related Bellevue Base Yard Lighting Replacement Project
 - Washington State Department of Ecology (Ecology) Facility/Site Index
- 9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

In addition to the current project, there are three applications that are being prepared and will be submitted for governmental approval in or near Bellevue Base in the future: 1) TDC NRV Battery Infrastructure Project at Bellevue Base by Metro, 2) Bellevue Base Yard Lighting Replacement Project by Metro, and 3) 124th Avenue NE Corridor Project by City of Bellevue.

TDC NRV Battery Infrastructure Project at Bellevue Base by Metro

The scope of work for this project includes installation of three pedestal-type electrical vehicle chargers for Metro's non-revenue vehicles on the west side of the Operations and Maintenance Building. Metro is currently working with Puget Sound Energy to reach a service agreement. In addition to electrical charger installation, other minor work may include adding wheel stops, bollards, and restriping parking spaces, etc.

Bellevue Base Yard Lighting Replacement Project by Metro

The project is needed to enhance worker safety and must comply with Washington State Department of Labor and Industries (L&I) light level requirements because the current lighting

is out of date with current standards. Project construction and operation would occur within the 367,180-square-foot area of Bellevue Base, including the bus base portion of Bellevue Base and the employee parking lot to the east. The project would replace all existing floodlight brackets, fixtures, and conductors back to the light control panel. Floodlight concrete poles would be maintained, and all building light fixtures would be replaced. The project would involve installing six new 60-foot-high steel floodlight poles at the project site. Four poles with two light fixtures would be installed along the western and southern perimeters of the bus yard, and one pole also with two light fixtures would be installed outside the west entrance of the Operations and Maintenance Building. One pole with three light fixtures would be installed in the northwest corner of the Wash Building. In total, the project would replace or install 64 light fixtures on 46 poles or building-mounted brackets throughout the project site.

124th Avenue NE Corridor Project by City of Bellevue

This project is initiated by City of Bellevue (the city); Metro is reviewing the scope of work and is in negotiations with the city. The scope of work that Metro is aware of is stated in the following paragraphs:

The 124th Ave NE Corridor Project will regrade (steepen) Bellevue Base's driveway at 124th Ave NE approximately 135' in length x 36' maximum in width (width varies). The city will modify portions of Bellevue Base's storm drainage facilities. The existing landscape abutting the driveway will be removed and replaced. The existing light poles (1 at Bellevue Base) and 2 at East Base will be impacted and replaced by the city.

The city plans to close Bellevue Base's driveway onto 124th Ave NE for approximately 3 months and detour the buses to 127th Ave NE. The city plans to install a temporary traffic signal at Northup Way and 127th Ave NE to help alleviate traffic impacts and bus detour delays.

Additionally the adjacent property owner is planning to redevelop the property north of Bellevue Base for multifamily residences (two (2) fifty-unit condo buildings and 34 townhome units, and associated utilities and circulation roads) at parcel 2825059297, address 1733 127th Ave NE, City of Bellevue Pre-Development application number: 20 103752 DC. The city requires road improvements to 127th Ave NE for this development. Metro is one of five adjacent property owners that owns this private road. The city's zoning plan also shows a future greenway road, with half of which located on the northeast half of Bellevue Base and the other half of the road located on the neighbor planning the multifamily development. Metro has not been provided any updated proposed plans from the neighbor since predevelopment concept plans were shared with Metro in the summer of 2020. Adjacent property redevelopment and city's +/-3 month driveway closure and detour to 127th Ave NE will impact traffic and bus operations.

10. List any government approvals or permits that will be needed for your proposal, if known.

- City of Bellevue critical areas land use permit
- · City of Bellevue clearing and grading permit
- City of Bellevue electrical permit
- 11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

The goal of this project is to upgrade the current 4.9 GHz wireless network to a 5 GHz wireless network

using new Cisco wireless access points (WAPs) mounted on light poles or exterior building walls. This upgrade would allow and improve communication between bus and operations office computer systems for data integration. Project construction and operation would occur within the 367,180-square-foot area of Bellevue Base, in the bus yard portion of Bellevue Base (project site).

Twelve new Cisco WAPs would be installed throughout Bellevue Base: four mounted on floodlight poles along the western boundary, six on the exterior of the Operations and Maintenance Building, and two on the western corners of the Fuel Building.

New conduit, conduit supports, and junction boxes would be installed to route power to the WAPs mounted on floodlight poles. Conduit installation of two 2-inch schedule 80 high-density polyethylene (HDPE) communication and two 2-inch schedule 80 HDPE power would be installed at a minimum of 24 to 36 inches below grade. Existing conduits, running from the Operations and Maintenance Building to a southwest vault, would be utilized to avoid trenching or boring beneath the bus yard parking area. Directional boring along the western boundary would be utilized to minimize ground disturbance by installing up to four soil pits during construction. Twelve Type 1 inground metal junction boxes, with dimensions 22 inches long by 17 inches wide by 12 inches deep, would be installed along the western boundary. Four new aboveground cast metal junction boxes would be attached to conduit supports and an existing light pole, where AP8 would also be attached, at the southwest corner of Bellevue Base. All junction boxes would be paired: one to be used for communication and the other for electrical power. Eleven new conduit supports, with dimensions 6 inches long by 12 inches wide by 6 inches deep, would be installed to accommodate and connect conduits to the 4 new aboveground junction boxes. Most ground disturbance areas would be within 5 feet of the perimeter curb.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

Street address: 1790 124TH AVE NE, Bellevue, WA 98005

King County property parcel number: 2825059295

Legal description: POR PARCEL '1' REV CITY OF BELLEVUE SP #77-81 REC #7912319005 DESC AS FOLLOWS BEG AT CENTER OF STR 28-25-05 TH S 88-22-07 E 30 FT M/L TO NXN WITH E MGN OF 124TH AVE NE & W MGN OF PARCEL 3 OF SP NO 77-81 REVISED AF #7912319005 - TH N 00-42-15 E 813.76 FT M/L TO NW COR OF SD PARCEL '1' TH S 88-23-06 E ALG N MGN OF SD PARCEL '1' 626.88 FT M/L TO A COR OF SD PARCEL '1' TH S 00-47-17 W 60 FT TO TPOB TH N 88-23-06 W 467 FT PLW N MGN OF SD PARCEL '1' TH S 30-04-42 E 689.72 FT TH S 88-22-37 E 439 FT M/L TO NXN WITH E MGN OF SD PARCEL '1' TH N 00-52-25 E 489 FT M/L ALG SD E MGN TO A CORNER OF PARCEL '1' SD BEARING BEING IDENTICAL WITH N 00-52-19 E AS SHOWN ON E MGN OF PARCEL '1' OF SP 77-81 REVISED TH N 88-22-37 W 326.62 FT M/L TO A CORNER OF SD PARCEL '1' TH N 00-47-20 E 97.93 FT M/L TO TPOB TGW N 60 FT OF SD PARCEL '1' SD SP DAF -PARCEL 1,2,3 & 4 OF SP 77-81 REC #7712130634 SD SP DAF - W 330 FT OF SW 1/4 OF NE 1/4 OF STR 28-25-05 LESS N 132 FT THOF LESS W 30 FT THOF FOR ST TGW POR OF W 1/2 OF W 1/2 OF NE 1/4 OF SD SEC 28 LY SLY OF CO RD #833 LESS W 330 FT THOF LESS ANY POR FOR SR #520 TGW POR OF E 1/2 OF W 1/2 OF NE 1/4 OF SD SEC 28 LY SLY OF CO RD #833 LESS E 330 FT THOF LESS ANY POR FOR SR #520 TGW POR OF NW 1/4 OF SE 1/4 OF SD SEC 28 LY N OF A LN PLT & 394.4 FT SLY FR N LN THOF LESS S 300 FT THOF LESS E 300 FT THOF LESS W 30 FT FOR ST

PLat Block: Plat Lot:

B. Environmental Elements [HELP]

a.	Earth	[hel	p	ı

a. General description of the site:
(circle one) Flat, rolling, hilly, steep slopes, mountainous, other

The project site generally slopes from northeast to southwest with an approximate 4% slope. The site is generally flat, with the exception of the southwestern and southern portion of the site, where the site borders the West Tributary to Kelsey Creek (West Tributary) and has the steepest slope of approximately 40%.

b. What is the steepest slope on the site (approximate percent slope)?

40% is the steepest slope within the project site.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

The project site has two mapped soil units (Figure 3). Soil Unit Sk, Seattle Muck, is mapped in the northwest portion of the project site. This soil is found in depressions and formed from grassy organic material. It is frequently flooded, poorly drained, and considered hydric. The remainder of the project site is mapped as EvC, Everett very gravelly sandy loam, 8 to 15% slopes. This soil is formed from sandy or gravelly glacial outwash and is typically located along foot of slopes or shoulders. It is not flooded and is excessively drained; it is not considered hydric.

According to the United States Department of Agriculture (USDA) Natural Resources Conservation Service, Seattle Muck is rated as prime farmland if drained. Everett very gravelly sandy loam, 8 to 15% slopes is rated as farmland of statewide importance. However, the project site is in a highly developed urban area and is not within any Farmland Preservation Properties or Agricultural Production Districts per the King County Farmland Preservation Program Protected Farmland Map. Therefore, the project site should not have any agricultural land of long-term commercial significance.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

Per the 2020 Critical Area Evaluation and Geotechnical Recommendations Yard Lighting Replacement for King County Metro Bellevue Base memo by the Riley Group (2020), the western portion of Bellevue Base was likely a fill slope which appeared to be stable with no signs of "previous settlement or failure." In addition, according to the site visit conducted in 2020, Metro's consultant observed steep slopes near the project site, but did not see any surface indications or history of unstable soils within the immediate vicinity of the project site.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

Trenching/directional boring for conduit replacement/installation, and junction box and conduit

support installation would be the main activities requiring soil disturbance. At a minimum, approximately 161.5 square feet of ground surface area and approximately 656.75 cubic feet of soil/ground materials would be disturbed to install new conduits, conduit supports, and junction boxes. This total would include excavation for 1) four entry and exit soil pits for directional boring, measuring approximately 6 feet long by 3 feet wide by 3 feet deep; 2) directional boring, between 24 and 36 inches below grade, along the western boundary; 3) one trench, measuring approximately 54 feet long by 8 inches wide by 24 inches deep, running from the southwest vault to the nearest Type 1 junction boxes to the northwest, and to an exit boring pit to the southeast. This trenching would be completed on top of the planned directional boring; 4) four trenches, measuring 5 feet long by 0.8 foot wide by 2 feet deep, running from Type 1 junction boxes to two light pole foundations (light pole supporting AP10 and AP11 and light pole supporting AP9); 5) twelve Type 1 junction boxes, measuring 22 inches long by 17 inches wide by 12 inches deep; 6) eleven conduit supports, measuring 6 inches long by 12 inches wide by 6 inches deep. Four new aboveground cast metal junction boxes would be attached to the new conduit supports and an existing light pole, where AP8 would also be attached, at the southwest corner of Bellevue Base. Existing grade that is disturbed to install conduits, conduit supports, and junction boxes would be restored to match predisturbance conditions. Excavated soils, if suitable, would be used to backfill excavations after conduit installation. (Figure 8, Figure 9)

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

During construction, clearing, grading, excavating, soil stockpiling, and other construction activities could temporarily reduce soil stability, resulting in erosion. Chance of significant erosion risk is low because clearing will be limited and best management practices to control erosion will be employed.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings).

About 90% of the site is currently covered with impervious surfaces. Wireless Access Points (WAPs) are mounted on existing light poles and buildings and would not create new impervious surfaces. Four new aboveground cast metal junction boxes would be attached to the new conduit supports and an existing light pole, where AP8 would also be attached, at the southwest corner of Bellevue Base, and would not increase impervious surface by touching the ground. Twelve new Type 1 metal junction boxes, with dimensions 22 inches long by 17 inches wide by 12 inches deep buried flush with the ground surface, and 11 new conduit supports, with dimensions 6 inches long by 12 inches wide by 6 inches deep, would replace bare ground or weedy species, such as Himalayan blackberry, English ivy, or St. John's wort. This would increase the hard surfaces within the project site by 37.5 square feet or 0.01% of the total project site. (Figure 9) This increased impervious surface is minimal in comparison to the remainder of the project site, as well as when compared to the surrounding area, which is highly developed. (Appendix A)

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

A project specific Temporary Erosion and Sedimentation Control Plan (TESC) will be prepared. Best Management Practices (BMPs) identified in the TESC will be followed to control the risk of erosion. In addition, existing vegetative ground cover will be preserved to the extent practicable. These measures would reduce or control erosion and subsequent sedimentation that might otherwise occur during ground disturbing activities.

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

Emissions from construction vehicles and equipment may temporarily affect local air quality during construction of the project. The emission quantities have not been estimated; however, they are not expected to exceed local emissions standards.

Fugitive dust emissions may also occur as a result of clearing, excavating, and other construction activities. Potential for fugitive dust would be higher during dry, warm weather conditions when wind and construction equipment create more dust.

Upon completion of project construction, there would be no project-related air emissions. Vehicular emissions would not increase during the operation of the project. Emissions from maintenance activities are not expected to exceed local emissions standards.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

No off-site sources of emissions or odors are anticipated to affect the project proposal.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Air quality impacts would be temporary and limited to the period of construction. Construction crews would be required to implement measures to minimize impacts on air quality, including (but not limited to):

- Covering loads of excavated materials
- Cleaning vehicles and equipment prior to leaving the construction area
- Installing and maintaining construction area entrances and exits
- Removing soil deposited on public lands
- Performing proper vehicle maintenance
- 3. Water [help]
- a. Surface Water: [help]
 - 1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Yes. The West Tributary to Kelsey Creek (West Tributary) is a perennial stream that runs adjacent to the western and southern extent of the project site. In addition to the creek, two wetlands were identified immediately adjacent to the northern, western, and southern extent of the project site during the critical area investigation (Figure 4).

The West Tributary has been identified as a class F stream or fish bearing stream by the City of Bellevue and King County. A hydrologically connected, seasonally flooded freshwater scrub-shrub wetland and permanently flooded aquatic bed pond were identified and labelled as BB1 in the study area adjacent to the western and southern extent of the project site. BB1 is a Category II wetland

with a habitat score of 6. A roadside swale immediately north of Bellevue Base was identified as a seasonally flooded freshwater broad-leafed deciduous forest wetland in the study area. The swale was labelled as BB2 and is a Category IV wetland with a habitat score of 4. The project site lies within the Kelsey Creek Basin, Lake Washington Watershed (WRIA 8), State Stream #08-0259.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Yes. Five out of twelve Wireless Access Points (WAPs) are within a critical area buffer or structural setback for the West Tributary and/or wetland. The trenching/directional boring on the western boundary of the parcel is within a critical area buffer or structural setback for the West Tributary and/or wetland. The project is designed to avoid any work below the OHWM of the West Tributary and outside the wetland boundary. Most of the project site is located within 200 feet of the West Tributary and/or wetland. No in-water work is needed to execute the project.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

No amount of fill, dredge, or discharge material would be placed in or removed from surface water, wetlands, or waterways. Directional boring would require water, which would come from the buildings on site, and all slurry material as a result of directional boring would be collected, contained in a closed vessel and disposed of at a permitted off-site location.—The project footprint would remain above the OHWM of the West Tributary and outside the wetland boundary.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No, the project would not require any surface water withdrawals or diversions. Directional boring would require water, but the water would come from the buildings on site.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No, the project site is outside of the 100-year floodplain based on the Federal Emergency Management Agency (1995) Flood Insurance Rate Map for King County Washington Incorporated Areas.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

The project would not discharge any waste materials to surface waters.

- b. Ground Water: [help]
 - 1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

The project would not withdraw groundwater from a well for drinking water or other purposes. The project would not discharge water to groundwater.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals...; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

The project would not discharge waste material into the ground from septic tanks or other sources.

- c. Water runoff (including stormwater):
 - 1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Runoff, including stormwater, would continue to be collected via storm drains onsite. During construction, any encountered groundwater or stormwater would be collected, pumped to a 55-gallon (mininum) drum and allowed for the particulates to settle out prior to discharge into the existing storm conveyance system. No additional stormwater treatment facilities are proposed.

2) Could waste materials enter ground or surface waters? If so, generally describe.

During the site visit, Metro's consultant observed that groundwater was present 8" below ground surface at an elevation of 135 feet above sea level in the northern portion of Wetland BB1 complex at sampling point Bb-4 (Figure 4). Per King County iMAP, the paved curb located in the southwestern portion of the bus yard has the lowest elevation, which is approximately 140 feet above sea level. Therefore, groundwater in Bellevue Base is estimated to be 5 feet below ground surface in some project areas. Since the wireless access points are either mounted on existing light poles or buildings, and the anticipated trenching or directional boring depth will not exceed 3 feet below ground, the chance of encountering groundwater and waste materials entering ground or surface waters is relatively low.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

No, the project would not alter or otherwise affect drainage patterns in the vicinity of the site.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

A project-specific TESC describing erosion and sediment control guidelines along with temporary and permanent erosion and sediment control measures will be developed. The TESC, in conjunction with a project specific stormwater pollution plan (SWPPP) will describe measures to reduce or control any groundwater, stormwater and drainage pattern impacts.

- 4. Plants [help]
- a. Check the types of vegetation found on the site:

b. What kind and amount of vegetation will be removed or altered?

Existing vegetation would be protected to the extent possible. Surface disturbance would involve trenching and/or directional boring for conduits. Surface disturbance would take place within areas dominated by weedy species such as blackberries (*Rubus armeniacus*), St. John's wart (*Hypericum perforatum*), perennial grasses, English ivy (*Hedera helix*), and bare ground along the boundaries. Existing grade or elevation would be restored to match existing conditions.

c. List threatened and endangered species known to be on or near the site.

No threatened or endangered plant species are documented within or near the site (Washington State Department of Natural Resources 2020).

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

When the construction is completed, the contractor will restore both the disturbed pervious and impervious areas to preconstruction conditions.

Additional possible available measures may involve wetland buffer mitigation including removal of invasive species such as Himalayan blackberry and English Ivy along the wetland buffer in the project property. This removal would improve habitat in the wetland complex and riparian corridor. Impacts on top of bank buffer or setback of the West Tributary could also be mitigated through management of invasive species above the OHWM, which would improve riparian habitat.

e. List all noxious weeds and invasive species known to be on or near the site.

According to the King County Noxious Weed List, 7 plant species observed onsite are considered Class C noxious weeds. They are field bindweed (Convolvulus arvensis), English hawthorn (Crataegus monogyna), English ivy (Hedera helix), Common St. Johnswort (Hypericum perforatum), reed canary grass (Phalaris arundinacea), Himalayan blackberry (Rubus armeniacus), and Nonnative Cattail (Typha sp.). In addition, purple loosestrife (*Lythrum salicaria*), a Class B noxious weed, was observed during field investigations. Finally, three plant species observed onsite are considered King County weeds of concern. They are English holly (Ilex aquifolium), creeping buttercup (Ranunculus repens), and climbing nightshade (Solanum dulcamara).

5. Animals [help]

a. <u>List</u> any birds and <u>other</u> animals which have been observed on or near the site or are known to be on or near the site.

Exampl	es	incl	lud	e:

birds: hawk, <u>heron</u>, eagle, <u>songbirds</u>, other: <u>woodpecker</u>, <u>hummingbird</u>, <u>American goldfinch</u>, <u>Red-winged blackbird</u>, <u>crow</u>, <u>Virginia rail</u> mammals: deer, bear, elk, <u>beaver</u>, other: _____ fish: bass, <u>salmon</u>, <u>trout</u>, herring, shellfish, other: _____

b. List any threatened and endangered species known to be on or near the site.

The Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) map documents resident coastal cutthroat (*Oncorhynchus clarki*) occurring within and migrating through the site (Figure 5). WDFW SalmonScape also mapped Chinook (*Oncorhynchus tshawytscha*), coho (*Oncorhynchus kisutch*), and steelhead (*Oncorhynchus mykiss*) gradient accessible habitat in the West Tributary (Figure 6). Although the *2016 West Tributary Habitat Assessment* also determined the tributary to be appropriate fish habitat, it stated that there was no spawning habitat along the project reach and that habitat quality suffered from a dense reed canary grass (*Phalaris arundinacea*). The assessment recommended revegetation with a mix of native trees, shrubs, and herbaceous species along with wood placement to improve habitat (Tetra Tech 2016). Finally, Ecology's *Puget Sound Watershed Characterization Project (2019)* notes the watershed basin is important for local salmonid habitat but has poor quality wetland, floodplain, and terrestrial habitats for other wildlife (Figure 7).

c. Is the site part of a migration route? If so, explain.

The project site is located along the Pacific Flyway migration route for birds. Since no riparian vegetation would be removed for this project, impacts on migrating birds are unlikely.

d. Proposed measures to preserve or enhance wildlife, if any:

Construction activities have been sited to avoid work in or around jurisdictional waters to protect existing resources.

e. List any invasive animal species known to be on or near the site.

The Kelsey Creek Basin is infested with the New Zealand Mud Snail (*Potamopyrgus antipodarum*). Although the species has yet to be detected in the onsite reach of Kelsey Creek, they have been detected in areas of Kelsey Creek that flow into this tributary.

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

The project would require electricity to power the Wireless Access Points (WAPs) and other equipment related to the NGW network.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

The project would not affect any solar energy uses on adjacent properties.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

This project is replacing the 4.9 GHz wireless network, which was installed in 2009, with a new 5 GHz WiFi network as part of the installation of the On-Board System/Communication Center System (OBS/CCS). The new 5 GHz WiFi network would utilize WAPs, with each WAP consuming about 12 watts. This level of energy consumption is less than what a typical LED flashlight would consume. Therefore, there are no energy conservation features proposed at this time.

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

Ecology's Facility/Site index (Appendix B; Ecology 2020a) indicates that Bellevue Base has most recently been documented for Hazardous Waste Management Activity—a facility that is required to have a state or U.S. Environmental Protection Agency identification but does not generate any hazardous waste. The last interaction when Bellevue Base was documented as a Hazardous Waste Generator— an Interaction Name applied to any facility that produces any quantity of hazardous waste, was dated December 31, 2016, with no interactions recorded for the past 4 years. The Hazardous Waste Management Activity interaction description started on December 31, 2016 and is still applicable today (Appendix B; Ecology 2020a). Bellevue Base also received a No Further Action Determination from the Department of Ecology on January 2, 1998, stating that the release of total petroleum hydrocarbons into the soil and groundwater no longer poses a threat to human health or the environment (Appendix C; Ecology 2020b). Therefore, there is a low risk of encountering any environmental health hazards during construction and operation of the proposed project.

1) Describe any known or possible contamination at the site from present or past uses.

Common hazardous wastes related to Bellevue Base operations include fuel, used shop towels, aerosol cans, batteries, solvents, and possibly used oil. The Ecology's Facility/Site index noted underground storage tanks were used in Bellevue Base to contain regulated substances in 1984. From April 29, 1987 to December 31, 2009, Ecology documented Bellevue Base as a Hazardous Waste Generator, an Interaction Name applied to any facility that produces any quantity of hazardous waste. From January 1, 1991 to May 1, 2001, Bellevue Base was documented by Ecology as a Hazardous Waste Planner - a facility generating more than 2,640 pounds of hazardous waste per year. In 1992, Bellevue Base started to report to Ecology for storing 10,000 pounds or more of a hazardous chemical, or 500 pounds or less of an extremely hazardous chemical annually.

From June 25, 1997 to January 2, 1998, Ecology noted a historic leaking underground storage tank with the site being cleaned up with Ecology's oversight or review. On July 24, 1998, Bellevue Base obtained a general permit to discharge contaminated stormwater into state waters. Since December

- 31, 2005, Bellevue Base has had interactions with Ecology documented either as a Hazardous Waste Management Activity or a Hazardous Waste Generator (Appendix B; Ecology 2020a). As mentioned above, Bellevue Base also received a No Further Action Determination from the Department of Ecology on January 2, 1998, stating that the release of total petroleum hydrocarbons into the soil and groundwater no longer poses a threat to human health or the environment (Appendix C; Ecology 2020b).
- 2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

Bellevue Base has existing Underground Storage Tanks (USTs) that store fuel and existing distribution lines for fueling buses. Best Management Practices will be implemented to avoid disturbing existing USTs and fuel distribution lines. Moreover, Ecology has issued a No Further Action Determination to Bellevue Base. Therefore, the risk of existing hazardous chemicals/conditions affecting the project is low.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

The use and operation of construction equipment creates typical risks of exposure to gasoline, oil, hydraulic fluids, and related materials by accident. Equipment would be refueled in a designated area and appropriate containment measures would be implemented in accordance with King County standard construction specifications.

Operations would not generate or require any use or storage of toxic or hazardous chemicals over the life of the project.

4) Describe special emergency services that might be required.

No special emergency services would be required by the project. Construction would occur in a highly urbanized area where emergency services are readily available and entrance to the project site is easily accessed should these services be needed.

5) Proposed measures to reduce or control environmental health hazards, if any:

The contractor would prepare a detailed Spill Prevention Control and Countermeasures Plan, as necessary, which would identify all contingencies in the event of an accidental spill of hazardous materials. Equipment would be refueled in a designated area, with absorbent pads in place and spill containment equipment present to reduce the potential for contaminants to reach the water should any accidental spill or leakage occur. All heavy equipment would be inspected prior to operating each day during construction.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

Existing noise sources consist primarily of traffic and industrial activities near and at the project site. None of these existing sources of noise would affect the project.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Construction noise would be temporary and result from the use of vehicles and equipment. Project construction noise would occur during the regularly permitted hours for construction within the city limits of Bellevue outlined in the Bellevue City Code (BCC 9.18).

3) Proposed measures to reduce or control noise impacts, if any:

Short-term increases in noise would be limited to the construction period. To minimize noise impacts on the surrounding land uses, construction activities would be conducted during daytime hours as outlined by Bellevue City Code (BCC 9.18).

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

The project site is the Bellevue Base Facility for King County Metro Transit Department.

The surrounding parcels are a mixture of commercial, business, and industrial uses with residential properties farther to the north and west.

The project would not affect current land uses on nearby or adjacent properties.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

The project site has not been used as working farmlands or working forest lands. The project site is located in an industrialized area of Bellevue that is highly built out.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

There are no working farms or forest lands in the area.

c. Describe any structures on the site.

The project site has three buildings onsite. The larger building of the three contains office space and bus bays for the maintenance of a fleet of transit buses. The other two smaller buildings are the Wash Building and the Fuel Building, and they are used for cleaning and fueling the buses, respectively.

d. Will any structures be demolished? If so, what?

No structures would be demolished as a result of the project.

e. What is the current zoning classification of the site?

The project site is currently zoned as BR-R (Bel-Red Residential).

f. What is the current comprehensive plan designation of the site?

The current comprehensive plan designation of the site is BelRed-Residential.

g. If applicable, what is the current shoreline master program designation of the site?

No part of the site is within any designated shorelines.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

Yes. The West Tributary and the associated wetlands are designated critical areas and run along the southern and southwestern property boundaries of Bellevue Base. Steep slopes are also present outside or along the northern, southern, and southwestern property boundaries of Bellevue Base.

i. Approximately how many people would reside or work in the completed project?

The project would not result in an increase in staff.

j. Approximately how many people would the completed project displace?

The project would result in no displacement impacts; no measures are proposed.

k. Proposed measures to avoid or reduce displacement impacts, if any:

The project would result in no displacement impacts; no measures are proposed.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The project would not change any land uses; no measures are proposed.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

There are no nearby agricultural or forest lands of long-term commercial significance near the project site; no measures are proposed.

9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

No housing units would be provided.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

No housing units would be eliminated.

c. Proposed measures to reduce or control housing impacts, if any:

The project would not result in housing impacts; no measures are proposed.

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

The WAPs will be attached to light poles and buildings in Bellevue Base, and the WAPs will not increase the height of the light poles and buildings. The principal exterior building material (i.e. the WAPs) would be metal.

b. What views in the immediate vicinity would be altered or obstructed?

No views in the immediate vicinity would be altered or obstructed.

b. Proposed measures to reduce or control aesthetic impacts, if any:

The project would not alter the aesthetics of the current site use. WAPs and exterior conduits outside the Operations and Maintenance Building would be painted to match the color of the building.

11. Light and Glare [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

The project would install 12 WAPs on light poles and buildings throughout Bellevue Base. The WAPs would not produce any light or glare and would blend in with existing structures.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No, light or glare from the finished project would not be a safety hazard or interfere with views.

c. What existing off-site sources of light or glare may affect your proposal?

No existing offsite sources of light or glare would affect the project.

d. Proposed measures to reduce or control light and glare impacts, if any:

The project would not produce any light or glare; no measures to reduce or control light and glare impacts are proposed.

12. Recreation [help]

a. What designated and informal recreational opportunities are in the immediate vicinity?

There are limited recreational opportunities in the immediate vicinity of the project site. King County's Eastrail multi-use trail is located approximately 1,418 feet west of the project site. Eastrail provides opportunities for nonmotorized recreation and transportation.

b. Would the proposed project displace any existing recreational uses? If so, describe.

No, the proposed project would not displace any existing recreational uses.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

There are no recreational opportunities provided by the project. The project would have no impact on recreation; no measures are proposed.

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers? If so, specifically describe.

There are no recorded, reported, or suspected cultural resources in the project vicinity.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

Per Cultural Resources Screening for Bellevue Base TDC Network and Routers (1124429), KING 7308 is the ethnographic placename Te3u for Northrup Creek. Waterman (1922:191) provides no translation for this name. 45-KI-854 is the Midlakes Pioneer Cemetery. The cemetery included numerous Japanese families. It was reportedly moved in 1970, although not all of the graves have been confirmed. There are no other recorded, reported or suspected cultural resources within ½ mile of the project. (Appendix F)

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

The cultural resources screening was conducted by King County Archaeologist Tom Minichillo on January 6, 2021, using the Department of Archeological and Historic Preservation WISAARD database and the King County Cultural Resource Protection Project database. Mr. Minichillo's screening report concluded that the general setting of the project on an existing graded and paved roadway and within existing buildings with no recorded, reported, or suspected sites in the vicinity suggests a low likelihood for buried intact prehistoric archaeological deposits. The project site is not within a historic district. As a result, no further cultural resources review was needed.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

No measures are proposed because no known resources would be affected. In accordance with state law, if any suspected human remains or archaeological deposits are encountered during construction, then all activities will cease in that area while county policies are complied with.

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

124th Avenue NE is the primary arterial that provides bus access to the facility. Non-bus vehicles access to the facility via 127th Avenue NE. 127th Avenue NE will also provide temporary bus access for a few months in 2021.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

The alignment of Route 226 is 0.5 mile south of the project site. No Metro routes serve the project site.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

No additional parking spaces would be constructed as a result of the completed project. No parking spaces would be eliminated as a result of the completed project.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

No, the project would not require any new or improved roads, streets, pedestrian, bicycle, or state transportation facilities.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No, the project would not use water, rail, or air transportation.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

The project would not affect the number of vehicular trips following construction.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

No, the project would not interfere with, affect, or be affected by the movement of agricultural and forest products on roads or streets in the area because this is an urban area.

h. Proposed measures to reduce or control transportation impacts, if any:

Primary impacts on transportation would consist of machinery, equipment, and vehicles coming and going from the construction site onto 124th Avenue NE. Peak construction is expected to require twenty (20) vehicular trips per day. Since the project is entirely contained within the Bellevue Base, impacts on traffic are expected to be minimal and a project traffic control plan is unlikely to be needed or required.

15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

No, the project would not result in an increased need for public services.

b. Proposed measures to reduce or control direct impacts on public services, if any.

No measures are needed to reduce or control direct impacts on public services. The project would not affect the need for public services in the region.

-	_				
1	<i>~</i>	I Itil	ities	lha	n
•	U.	Ulli	ILIES	ше	w

a.	Circle utilities currently available at the site.	
<	electricity, natural gas, water, refuse service, telephone, sanitary sewer,	, septic system,
	other	

c. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

The area electrical utility is Puget Sound Energy (PSE). PSE already has a meter to monitor energy consumption for Bellevue Base and the proposed project's energy consumption would not require a service modification with PSE. The replacement and installation of conduit for the WAPs and connection to the existing PSE system would be needed. No further discussions with PSE would be required for this project.

C. Signature [HELP]

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature:	Lawrence Ching
Name of signee	e Lawrence Chung

Appendices

Appendix A Construction Set

Appendix B Washington State Department of Ecology Facility/Site Index

Appendix C Washington State Department of Ecology No Further Action Determination

Appendix D Critical Area Evaluation and Geotechnical Recommendations

Appendix E West Tributary Habitat Assessment

Appendix F Cultural Resources Screening for Bellevue Base TDC Network and Routers (1124429)

References

- City of Bellevue. 2015. *City of Bellevue Shoreline Master Program*. Available: https://bellevuewa.gov/sites/default/files/media/pdf_document/SMP_AttachC_Jurisdiction_Maps.pdf. Accessed: January 4, 2021.
- City of Bellevue. 2017. *Kelsey Creek Basin*. Available: https://bellevuewa.gov/sites/default/files/media/pdf_document/BasinFactSheet_KELSEY%20CR EEK.pdf. Accessed: December 31, 2020.
- City of Bellevue. 2019. *Comprehensive Land Use Plan*. Available: http://apps.bellevuewa.gov/gisdownload/PDF/Planning/complan2str_b_11x17.pdf. Accessed: January 4, 2021.
- City of Bellevue. 2020. *Aquatic Invasive Species*. Available: https://www.arcgis.com/home/webmap/viewer.html?webmap=6dc930695d1342fba0588d4ea11 e1531&extent=-122.471,47.4547,-121.8365,47.7801. Accessed: January 19, 2021.
- City of Bellevue. 2020. *Bellevue Map Viewer*. Available: https://cobgis.maps.arcgis.com/apps/webappviewer/index.html?id=e1748172d4f34f1eb3710032 a351cd57. Accessed: January 4, 2021.
- Degnan, J. Transit Engineer. King County Metro Transit, Seattle, WA. January 19, 2021—Report comment to Lawrence Chung, Environmental Planner, King County Metro Transit, Seattle, WA.
- Federal Emergency Management Agency. 1995. Flood Insurance Rate Map for King County Washington Incorporated Areas, Panel 368 of 1725. Map Number 53033C0368F. Effective May 16, 1995.
- King County. 2018. *Stream Report, Kelsey Creek 0444.* Available: https://green2.kingcounty.gov/streamsdata/watershedinfo.aspx?Locator=0444. Accessed: April 13, 2020.
- King County. 2019. Farmland Preservation Program. Available: https://www.kingcounty.gov/depts/dnrp/wlr/sections-programs/rural-regional-services-section/agriculture-program/farmland-preservation-program.aspx. Accessed: December 30, 2020.

- King County. 2020. *iMap Home*. Available: https://gismaps.kingcounty.gov/iMap/. Accessed: January 4, 2021.
- King County. 2020. *Noxious Weed List*. Available: https://www.kingcounty.gov/services/environment/animals-and-plants/noxious-weeds/laws/list.aspx. Accessed: January 3, 2021.
- Pacific Flyway Center. 2021. *North American Migratory Bird Flyways*. Available: https://pacificflywaycenter.org/. Accessed: January 4, 2021.
- Tetra Tech. 2016. West Tributary Habitat Assessment. Final Report. September. Prepared for City of Bellevue.
- The Riley Group. 2020. *Critical Area Evaluation and Geotechnical Recommendations Yard Lighting Replacement for King County Metro Bellevue Base*. Prepared for King County Metro.
- Ukrainczyk, L. Engineer III. King County Metro, Seattle, WA. December 22, 2020—Comment to Lawrence Chung, Environmental Planner II, King County Metro, Seattle, WA.
- U.S. Department of Agriculture (USDA) Natural Resources Conservation Service. 2020. *Web Soil Survey*. Available: https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. Accessed: January 5, 2021.
- U.S. Fish and Wildlife Service (USFWS). 2019. *National Wetland Inventory Mapper V2*. October 8, 2019. Available: https://www.fws.gov/wetlands/data/mapper.html. Accessed: October 4, 2020.
- Washington Department of Fish and Wildlife (WDFW). 2020a. *Priority Habitats and Species: Maps. PHS on the Web*. Available: http://apps.wdfw.wa.gov/phsontheweb/. Accessed: October 4, 2020.
- Washington Department of Fish and Wildlife (WDFW). 2020b. *SalmonScape*. Available: https://apps.wdfw.wa.gov/salmonscape/. Accessed: October 6, 2020.
- Washington State Department of Natural Resources (DNR). 2020. Washington Natural Heritage Program Element Occurrences Current. Available: https://data-wadnr.opendata.arcgis.com/datasets/washington-natural-heritage-program-element-occurrences-current?geometry=-122.199%2C47.625%2C-122.158%2C47.630. Accessed: October 6, 2020.
- Washington State Department of Ecology (Ecology). 2019. *Puget Sound Watershed Characterization Project*. Available: https://ecology.wa.gov/Water-Shorelines/Puget-Sound/Watershed-characterization-project. Accessed: January 4, 2021.
- Washington State Department of Ecology (Ecology). 2020a. *Facility/Site database*. Available: https://apps.ecology.wa.gov/neighborhood/. Accessed January 4, 2021.
- Washington State Department of Ecology (Ecology). 2020b. *No Further Action Determination*. Available: https://apps.ecology.wa.gov/gsp/CleanupSiteDocuments.aspx?csid=6026. Accessed January 4, 2021.

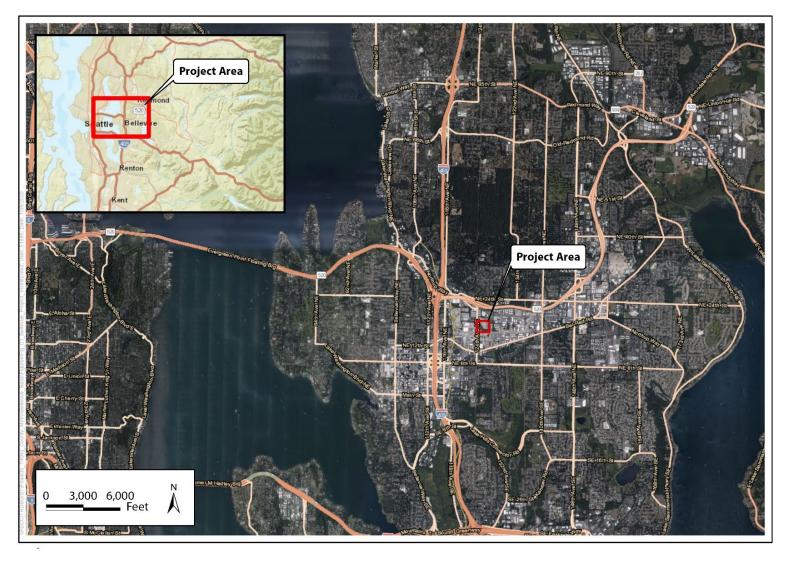


Figure 1

Bellevue Base Project Vicinity

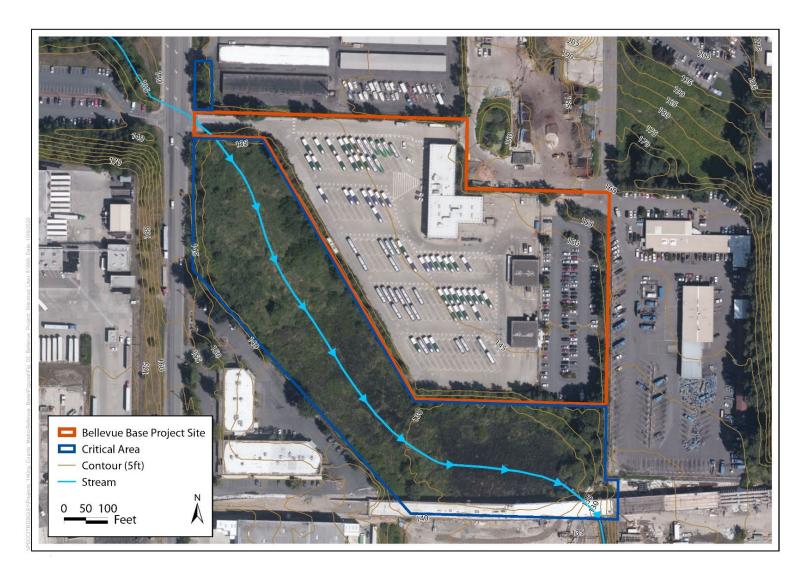


Figure 2
Bellevue Base Project Site and Adjacent Critical Areas



Figure 3

Soil Units Mapped in the Project Area, as indicated by orange box, and Hydric Soil Rating (NRCS 2019)

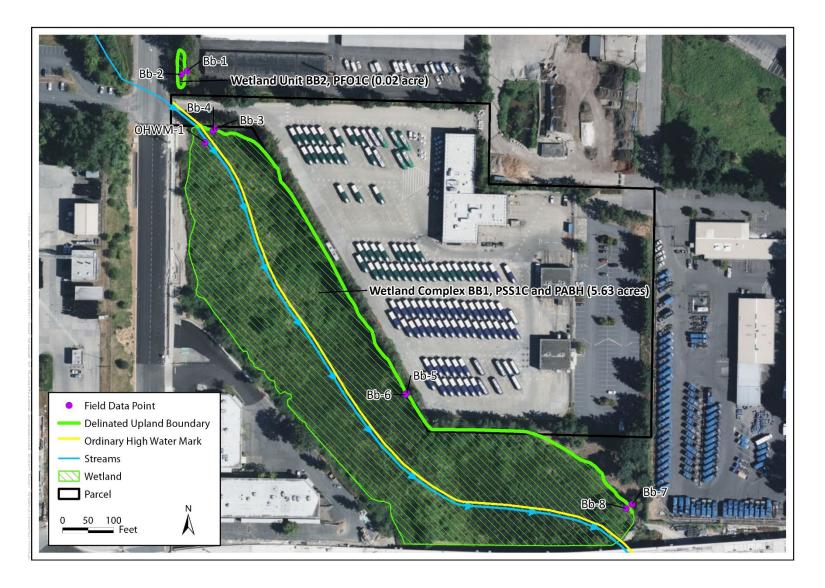


Figure 4
West Tributary OHWM Determination, Wetland Delineation, and Sample Plots

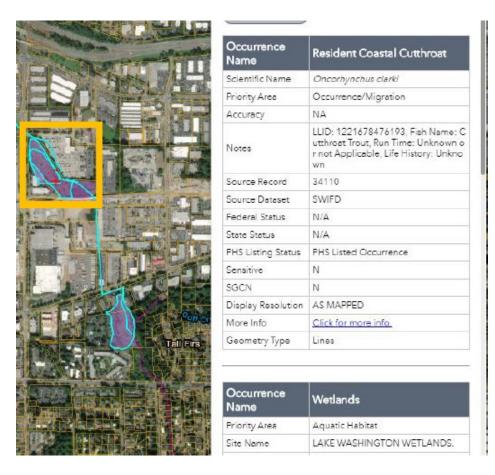


Figure 5 WDFW Priority Habitat Species Map. Project Area indicated by orange box.



Figure 6

WDFW SalmonScape Map. Though showing Spring Chinook, this range is identical for Winter and Summer steelhead, Coho, and Summer Chinook. Project area is indicated by black box.

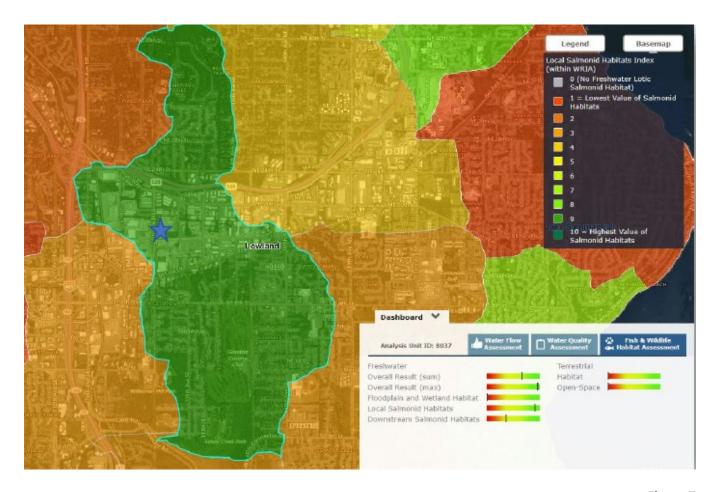


Figure 7
Ecology's Puget Sound Watershed Characterization Project Fish and Wildlife Habitat Assessment. Project area indicated by blue star.

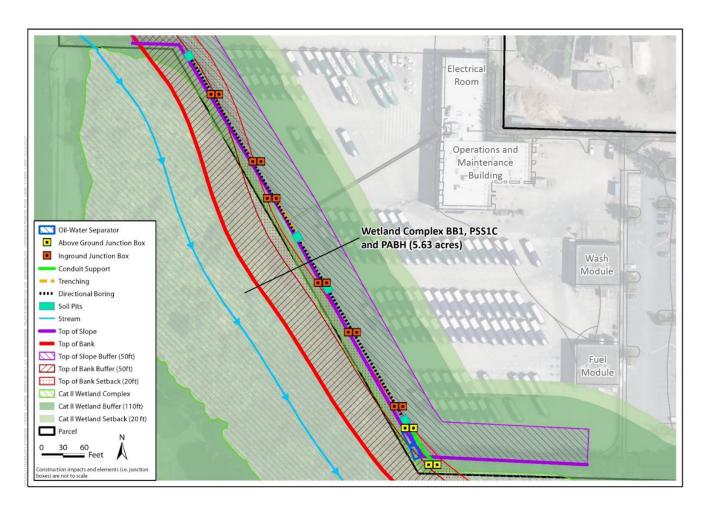


Figure 8
Temporary Impacts during Construction (No Buffer and Setback Exclusions)

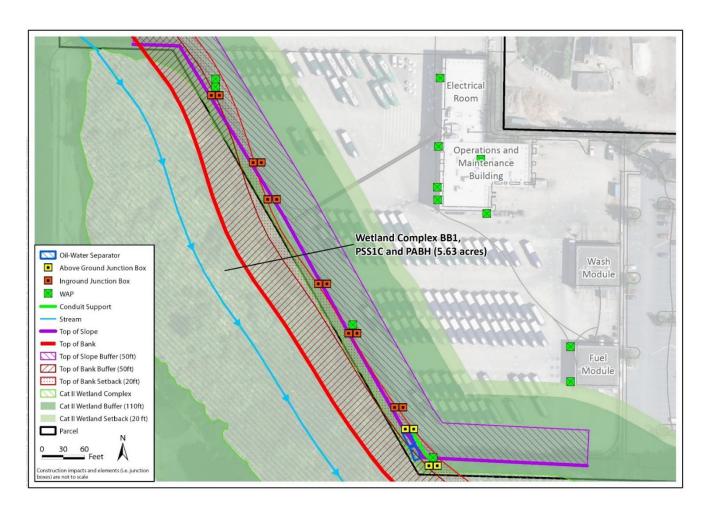


Figure 9
Permanent Impacts (No Buffer and Setback Exclusions)

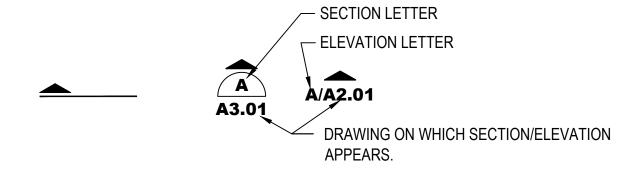
Appendix A Construction Set

TYPICAL SECTION AND DETAIL REFERENCING SYSTEM

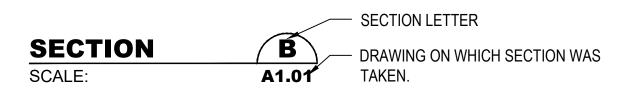
DRAWING NUMBERING SYSTEM KEY:

TELECOMMUNICATIONS

(1) THE SECTION IS CUT ON DRAWING A101:



(2) ON DRAWING A105 THIS SECTION IS IDENTIFIED:



(3) DETAILS ARE CROSS-REFERENCED IN A SIMILAR MANNER, EXCEPT THAT DETAILS ARE IDENTIFIED BY NUMBERS RATHER THAN BY LETTERS.

DISCIPLINE GENERAL CIVIL LANDSCAPE

STRUCTURAL

MECHANICAL

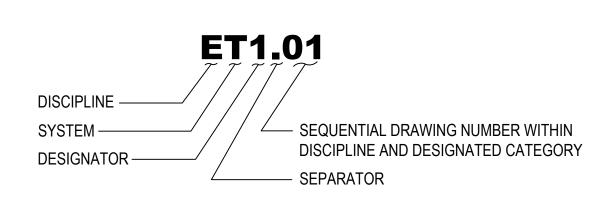
ELECTRICAL

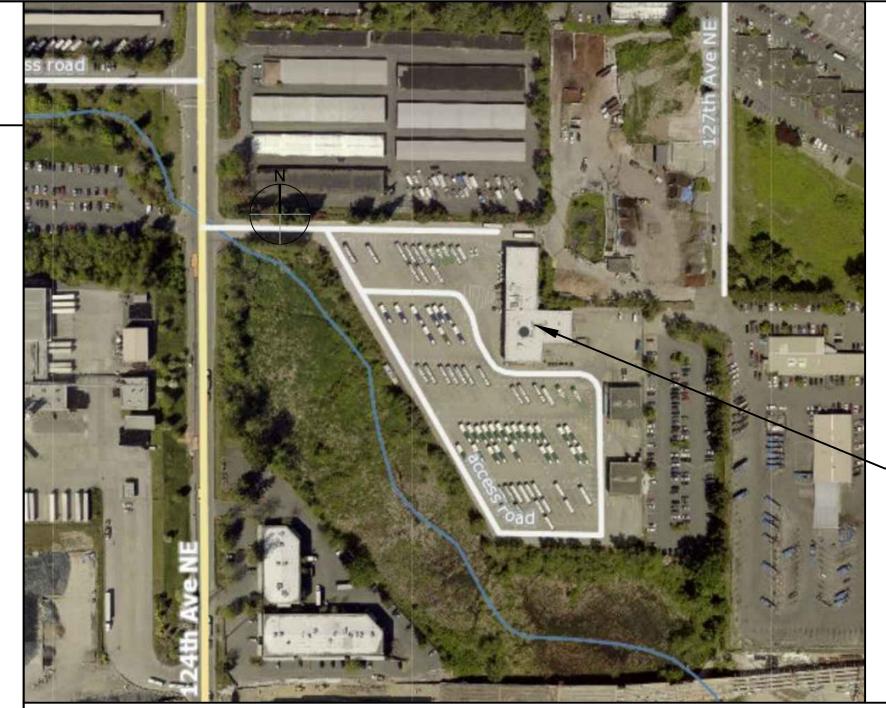
TRAFFIC CONTROL

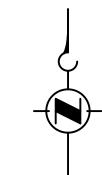
FIRE ALARM INTERCOM LIGHTING **POWER** SECURITY

DESIGNATED CATEGORY **GENERAL PLANS ELEVATIONS** SECTIONS ENLARGED PLANS DETAILS SCHEDULES & DIAGRAMS **USER DEFINED**

> **USER DEFINED** 3D VIEWS





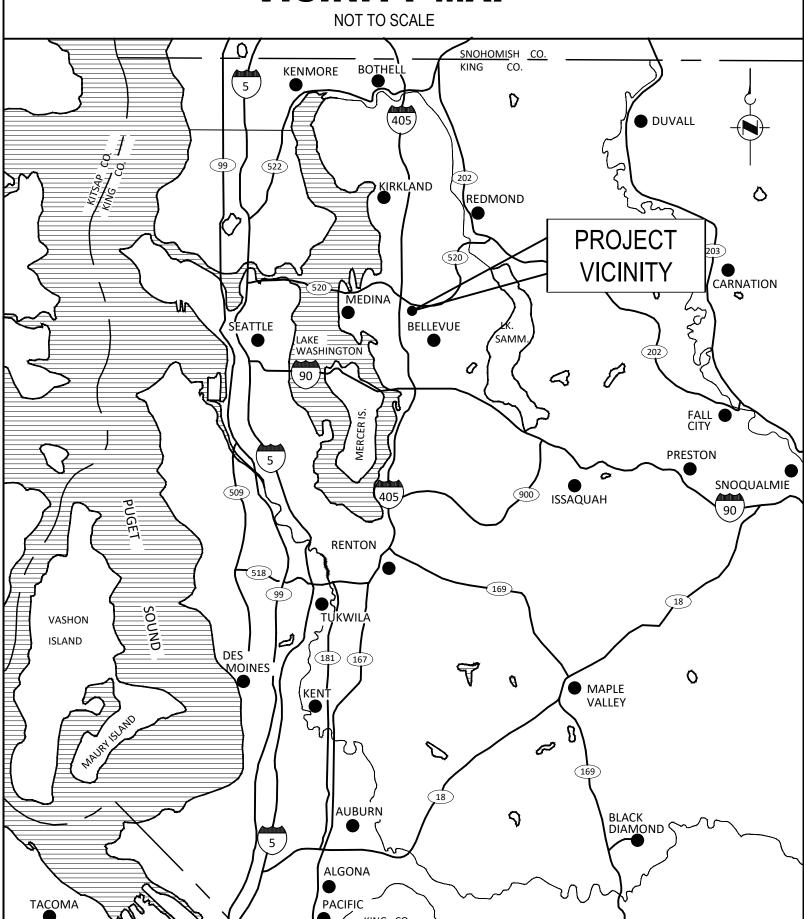


KING COUNTY METRO BELLEVUE BASE 1790 124th Ave NE Bellevue, WA 98005

LOCATION MAP

NOT TO SCALE

VICINITY MAP



SHEET INDEX

SHEET	DRAWING NUMBER	DESCRIPTION
1	G0.01	COVER SHEET
2	C1	SITE PLAN B
3	C2	SITE PLAN B DETAILS
4	E0.01	LEGEND AND ABBREVIATIONS
5	E1.01	KEY PLAN AND OVERALL AP LOCATIONS
6	E2.01	NORTH YARD DETAIL PLAN
7	E2.02	SOUTH YARD DETAIL PLAN
8	E6.01	PANEL SCHEDULE
9	ET2.01	NORTH YARD DETAIL PLAN
10	ET2.02	SOUTH YARD DETAIL PLAN
11	ET2.03	ELECTRICAL YARD PLAN DETAILS
12	ET2.04	ELECTRICAL YARD PLAN DETAILS
13	ET3.01	OPERATIONS AND MAINTENANCE BUILDING LEVEL 1 FLOOR PLAN
14	ET3.02	FUEL BUILDING FLOOR PLAN
15	ET4.01	MDF AND IDF DETAILS
16	ET5.01	OPERATIONS AND MAINTENANCE BUILDING RACK ELEVATION
17	ET5.02	FUEL AND WASH BUILDING RACK ELEVATION
18	ET5.03	AP INSTALLATION DETAILS
19	ET5.04	BRACKET DETAILS
20	ET5.05	CEILING (PIPE) MOUNTED WAP DETAILS
21	ET6.01	SCHEDULES
22	ET6.02	RISER DIAGRAM
23	ET9.01	EXISTING VAULT
24	ET9.02	ELEC RM 117 WALL ELEVATIONS
25	ET9.03	ELEC RM 135 WALL ELEVATIONS

GENERAL NOTES:

- CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE INTERNATIONAL BUILDING CODE AND THE LATEST EDITION OF THE JURISDICTIONAL BUILDING CODE AND AMENDMENTS. A COPY OF THE APPROVED PLAN, MUST BE ON SITE WHENEVER CONSTRUCTION IS IN PROGRESS.
- 2. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO INDEPENDENTLY VERIFY THE ACCURACY OF ALL BUILDING UTILITY LOCATIONS SHOWN AND TO FURTHER DISCOVER AND AVOID HARM TO ANY OTHER BUILDING UTILITIES NOT SHOWN HEREON WHICH MAY BE AFFECTED BY THE IMPLEMENTATION OF THIS PLAN.
- THE CONTRACTOR SHALL TAKE APPROPRIATE STEPS REQUIRED TO PROTECT EXISTING BUILDING UTILITIES, EQUIPMENT OR BUILT-IN FURNISHINGS REMAINING IN THE WORK AREA DURING
- 4. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND LOCATIONS PRIOR TO START OF WORK.
- ALL DEMOLITION DEBRIS MUST BE DISPOSED OF LEGALLY, OFF SITE.
- CONFORM TO SPECIFICATIONS POSTED TO PROJECT SHAREPOINT SITE.
- CONTRACTOR SHALL COORDINATE WITH THE PROJECT REPRESENTATIVE AND SEEK APPROVAL FROM BASE SUPERINTENDENT ON SETTING UP TRAFFIC CONTROL TO FACILITATE CONSTRUCTION. IMPLEMENTATION OF TRAFFIC CONTROL PLANS (TCPs)/MEASURES SHALL NOT IMPEDE BUS BASE OPERATION. APPROVED TCPs MAY NEED TO BE ADJUSTED IF NECESSARY.

BELLEVUE BASE NGW **NETWORK INTEGRATION**

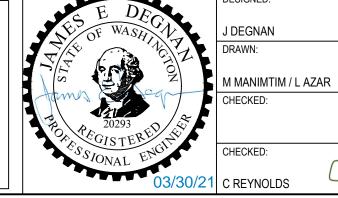
KING COUNTY

CONSTRUCTION SET - 03/30/2021

REVISION

BY APP'D DATE

THIS CONSTRUCTION WORK IS COMPOSED OF TWO PARTS. PART ONE -NON-SITE WORK; AND PART TWO - SITE WORK. NO WORK ON PART TWO SHALL COMMENCE UNTIL LAND USE AND GRADING PERMITS ARE ISSUED BY CITY OF BELLEVUE.



	DESIGNED:	APPROVED: FOR P ENG
	J DEGNAN	PENG
/	DRAWN:	
JON Z	M MANIMTIM / L AZAR	
	CHECKED:	PROJECT NO:
A SECTION AND A		1124429
	CHECKED:	CONTRACT NO:
3/30/21	C REYNOLDS	-

King County

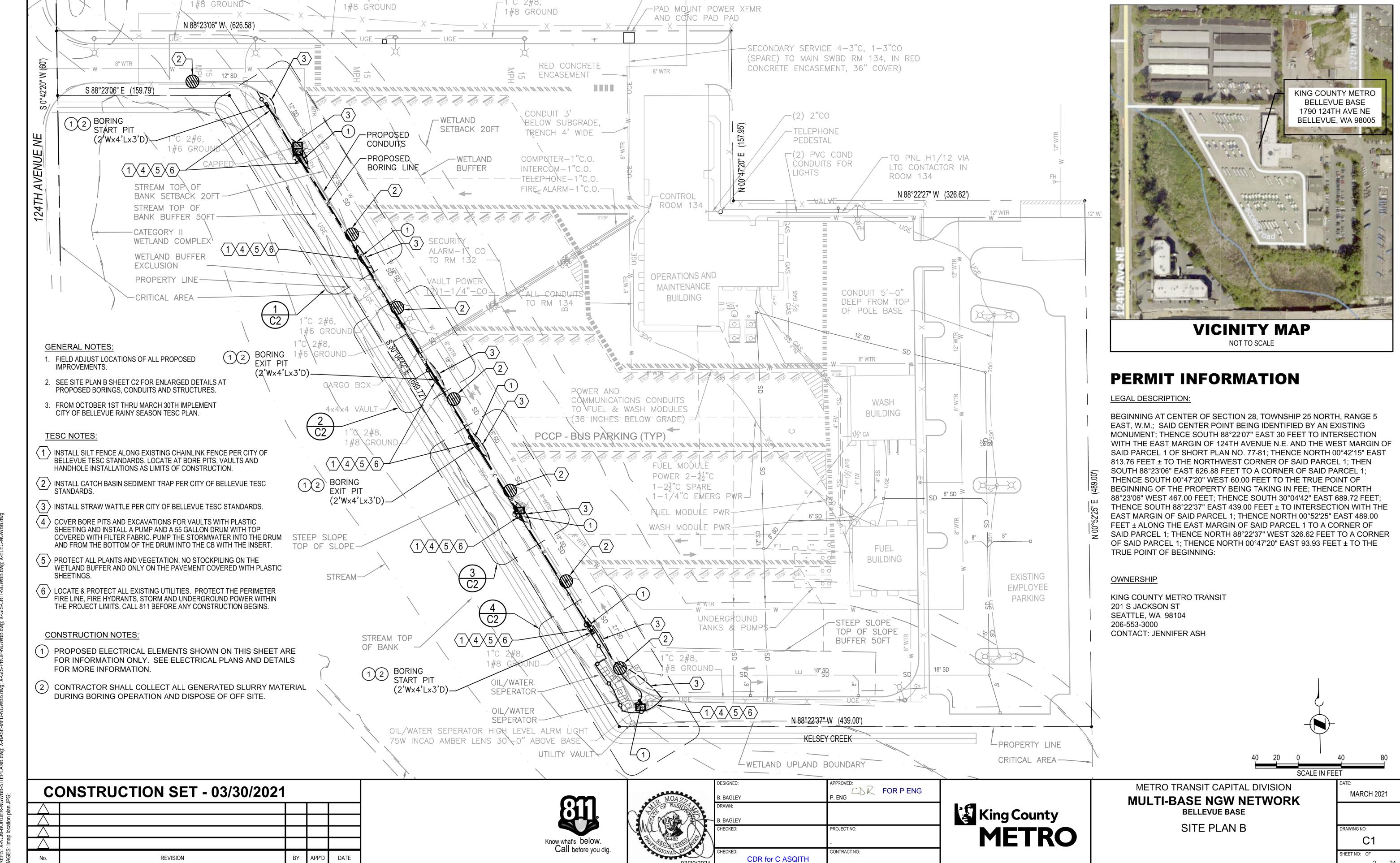
METRO

METRO TRANSIT CAPITAL DIVISION

MULTI-BASE NGW NEWTORK BELLEVUE BASE

COVER SHEET

MARCH 2021 G0.01 SHEET NO: OF

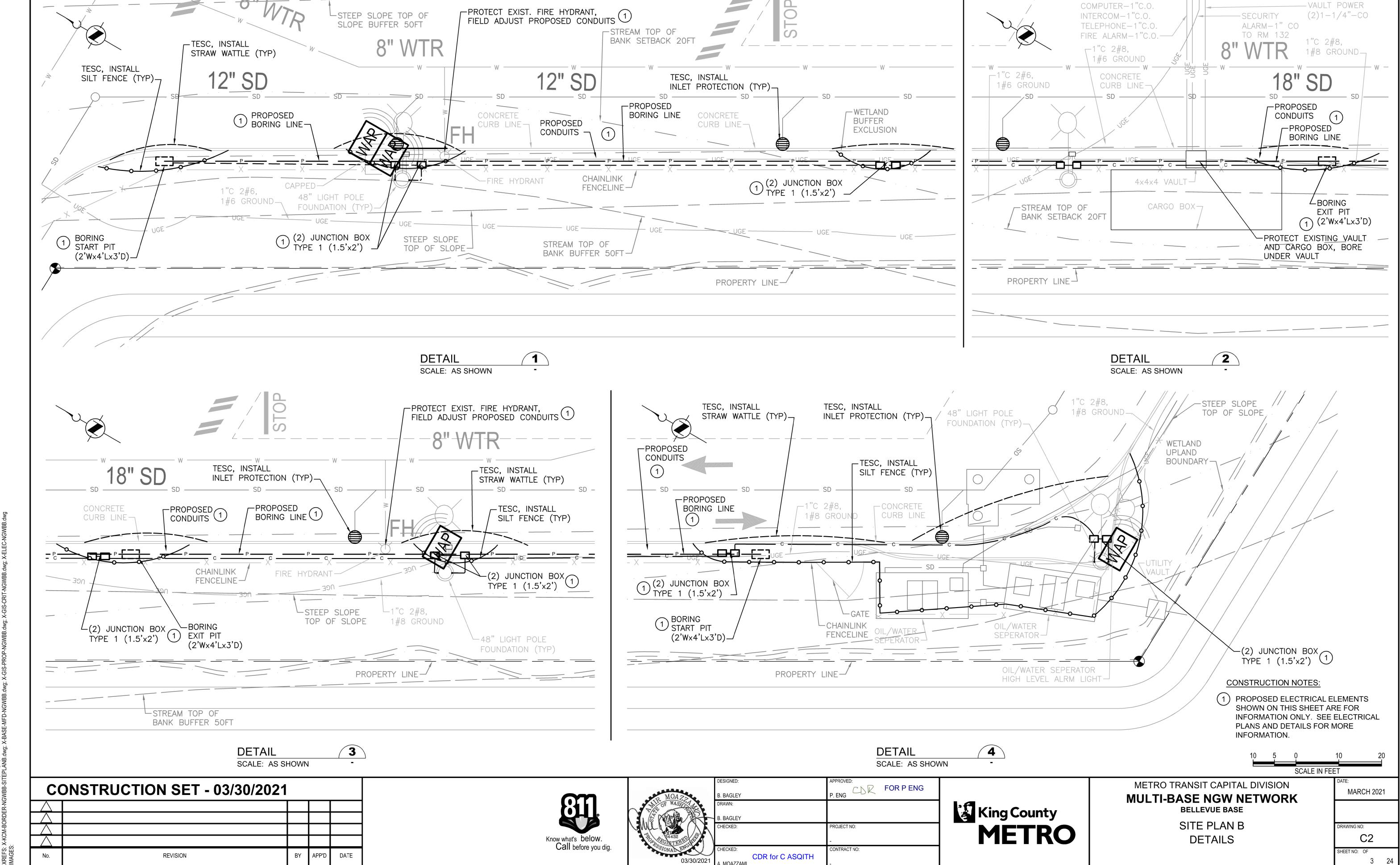


MOAZZAMI

-1200A, 4801/277V, 3ø 4W SERVICE

_1"C 2#8,

-1"C 2#8,



. MOAZZAMI

V:\Projects\Transit Properties\Operations Bases\N PLOTTED: Mar 31, 2021-08:28:52am By bagleyt XREFS: X-KCM-BORDER-NGWBB-SITEPLANB IMAGES:

ELECTRICAL DRAWING SYMBOLS AND ABBREVIATIONS

SYMBOL	DESCRIPTION	SYMBOL	WORK DEFINITION		ABBREVI	ATIONS
AP# WAP	CISCO AIRONET 1572EAC WIRELESS ACCESS POINT. DIRECTIONAL. SEE SCHEDULE ON SHEET ET6.02 FOR MOUNTING AND CONNECTION REQUIREMENTS.	+	NEW DEVICE (THICK LINETYPE) EXISTING DEVICE (THIN LINETYPE)	AFG ABOVE FINISH		RGS RIGID GALVANIZED STEEL TBD TO BE DETERMINED
AP#	CISCO AIRONET 1572EAC WIRELESS ACCESS POINT. OMNI DIRECTIONAL. SEE SCHEDULE ON SHEET ET6.02 FOR MOUNTING AND CONNECTION REQUIREMENTS.			AP ACCESS POIN AWG AMERICAN WI C CONDUIT E EXISTING		TYP TYPICAL W/ WITH W WIRE XFMR TRANSFORMER
JB	METAL JUNCTION BOX.			EF EXHAUST FAN EMT ELECTRICAL N FO FIBER OPTIC	N METALLIC TUBING	
PB1	6"x6"x4" NEMA 1 JUNCTION PULL BOX			FU FUSE G GROUND		
PB2	12"x12"x4" NEMA 1 JUNCTION PULL BOX			GND GROUND JB JUNCTION BO	X	
VLT H1	NEW 25-TA VAULT HANDHOLE PER WSDOT STANDARD PLAN J-40.10-04, TYPE 1 JUNCTION BOX			MIN MINIMUM NO. NUMBER		
•	CORE PENETRATION			NTS NOT TO SCALE PB PULL BOX STR STRAND	E	
	DUPLEX 120V 20AMP POWER OUTLET					
	QUAD 120V 20AMP POWER OUTLET					
	NEW RACEWAY (SEE STRUCTURAL DRAWINGS FOR TYPICAL SUPPO NEW UNDERGROUND RACEWAY	RTS)				
	EXISTING RACEWAY					
UGE	EXISTING UNDERGROUND RACEWAY UNDERGROUND ELECTRICAL					
	ELECTRICAL PANEL					
->	CONDUIT DOWN OR INTO PAGE					
	CONDUIT UP OR OUT OF PAGE					
J	J HOOK PATHWAY					
ONSTRUCTION SE	FT - 03/30/2021		DESIGNED:	APPROVED: FOR P ENG		METRO TRANSIT CAPITAL DIVISION MARC

BY APP'D DATE REVISION

ES E DEG	DESIGNED: J DEGNAN	APPROVED: FOR P ENG P ENG
A STAN	DRAWN: L AZAR / M MANIMTIM	
POR EGISTERED TE	CHECKED:	PROJECT NO: 1124429
O3/30/2021	CHECKED:	CONTRACT NO:

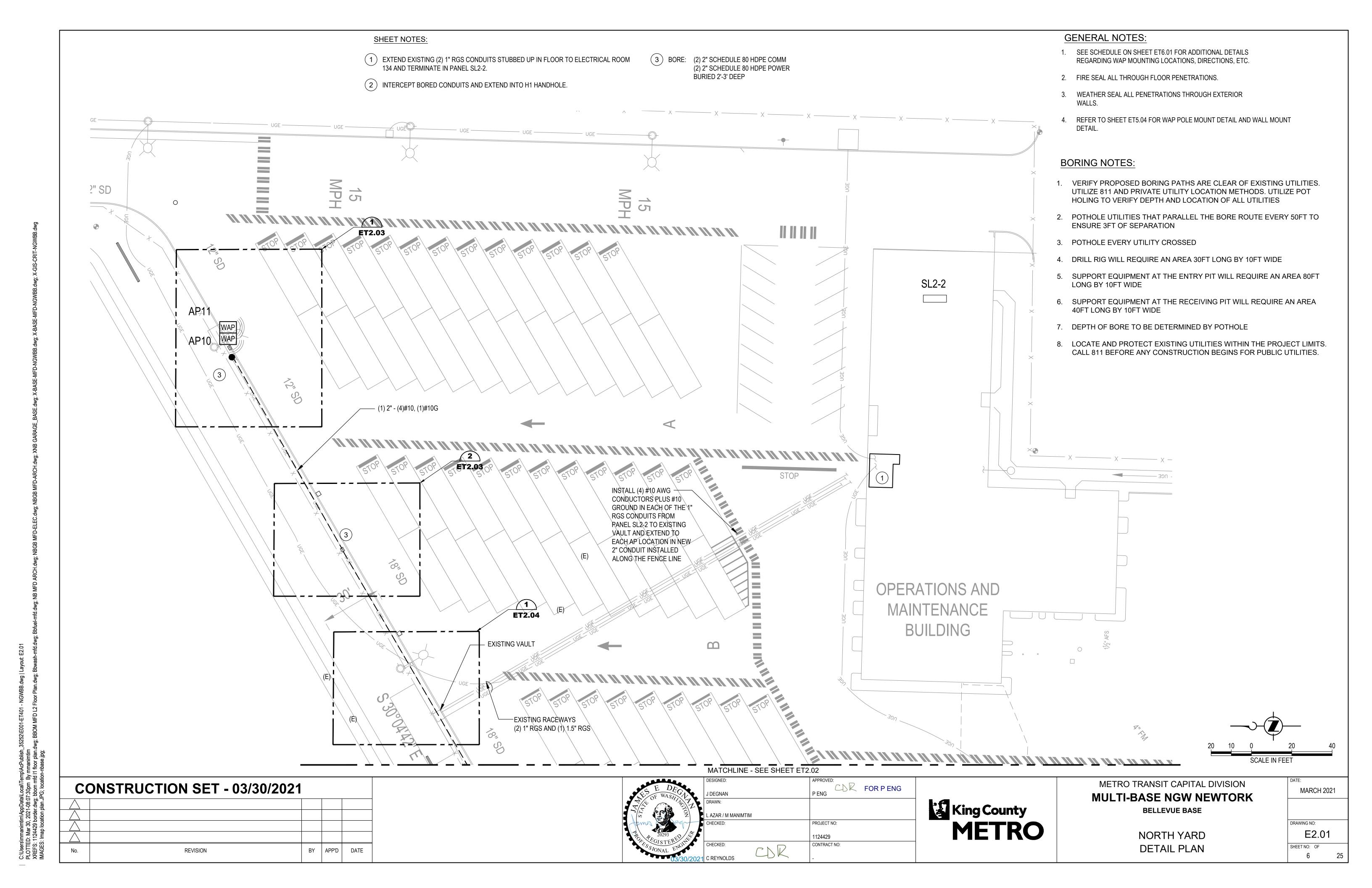
King County
METRO

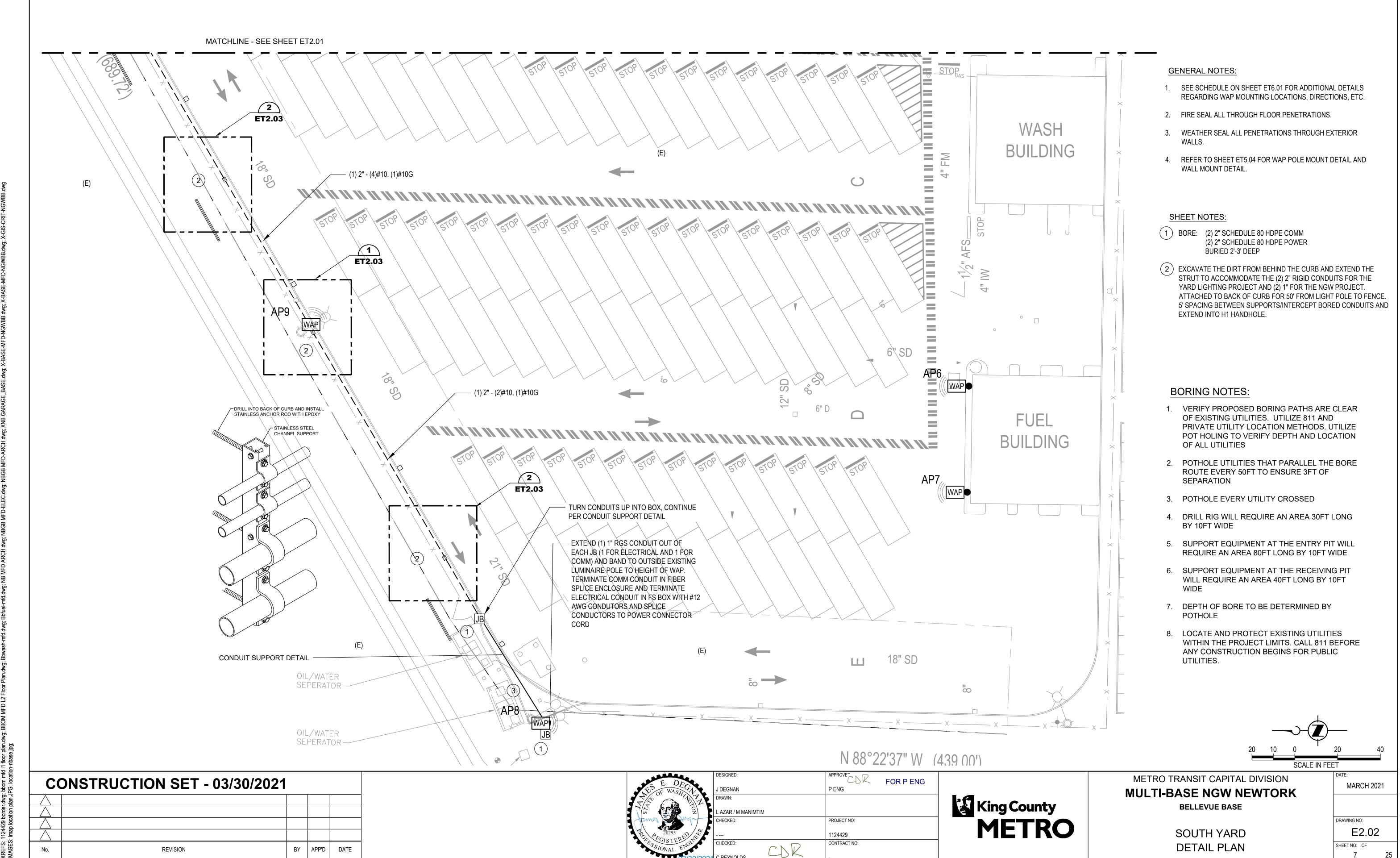
MULTI-BASE NGW NEWTORK

BELLEVUE BASE

LEGEND AND ABBREVIATIONS

DRAWING NO: E0.01





21 C REYNOLDS

LOCATION ELECTRICAL ROOM 135

1 SOURCE = SH1 2 <1> LOAD RELOCATED FROM PANEL EL2

BY APP'D DATE

REVISION

	3V, 3PH, 4W 225A BUS M.L.O	0011			16 MAR							
arcuit	Description/Location	LOAD (VA)	LOAD TYPE	OB AMP	CB POLE	PHASE	OB AMP	OB POLE	LOAD (VA)	LOAD TYPE	<u>'</u>	araui
	NOWARD						-		(VA)	1111	I	-
1	NGW AP8	20		15	1	a	20	1			SPARE	2
3	NGW AP9	20		15	1 1	b	20	1			SPARE	4
5	NGW AP10	20		15	1 1	С	20	1			SPARE	6
7	NGW AP11	20		15	1	a	20	1			SPARE	8
9	SPARE			20	1	b	20	1			SPARE	10
11	SPACE			20	1	С	20	1			SPACE	12
13	SPACE					a	-				SPACE	14
15	SPACE					b	+				SPACE	16
17	SPACE					С	+				SPACE	18
19	SPACE					a					SPACE	20
21	SPACE					b	1				SPACE	22
23	SPACE				1	С	1				SPACE	24
25	SPACE					a	1				SPACE	26
27	SPACE					b	1				SPACE	28
29	SPACE					С	-				SPACE	30
31	SPACE					a	-				SPACE	32
33	SPACE					b					SPACE	34
35	SPACE					С	-				SPACE	36
37	SPACE					a	1				SPACE	38
39	SPACE					b					SPACE	40
41	SPACE					С					SPACE	42
100 TOT	NN LOAD: Ph A	40	VA	40.0000	Α							
100 TOT	IN LOAD: Ph B	20	VA	20.0000	A				PANELB	OARD R	ATING: 10,000 A/C	
100 TOT	NN LOAD: Ph C	20	VA	20.0000	Α							
"MAX" PI	HASE CONN LOAD: Ph A	40	VA									
TOTAL C	ONNECTED LOAD (3 X MAX)I		KVA	0.0800	AMPS				TOTAL [DEMAND	LOAD: 0.9816 KVA 0.981	6 AMPS
				SUBFED LOADS		TOTAL LOADS	DEMAND FACTOR		DEM LO			
G	GENERAL (NON-CONT)	0		0		0	100%)		
L	LIGHTING	0		0		0	125%)		
R	RECEPTACLES - TO 10 KVA	0		0		0	100%)		
	OVER 10 KVA			0		0	50%					
 К	KITCHEN	0		0	Ì	0	100%		_)	ACCESSORIES	İ
<u></u> Н	HEATING	0		0	ĺ	0	100%)	 User Defined Additional Pa 	.nel
 М	MOTORS	0		0	Ì	0	100%)	Requirements>	
LM	LARGEST MOTOR	0		0	İ	0	125%)		1
WH	WATER HEATER	0		0	ĺ	0	100%)		
C	CONTINUOUS GENERAL LOAD	0.0800		0	Ì	0	125%	1	-)		
N	NON-COINCIDENT	0		0		0			_)		
DL	DEMAD LOAD (WAREHOUSE/ STORAGE)- to 12.5 KVA	0		0		0	100		_)		
	over 12.5 KVA						50)		

and the same of th	DESIGNED:		APPROVED.	
E DECL	J DEGNAN		P ENG	FOR P ENG
	DRAWN:			
	L AZAR / M MANIMTIM			
James Lagar	CHECKED:		PROJECT NO:	
20293			1124429	
OF REGISTERE LIGHT	CHECKED:	CND	CONTRACT NO:	
03/30/2021	C REYNOLDS		-	

King County

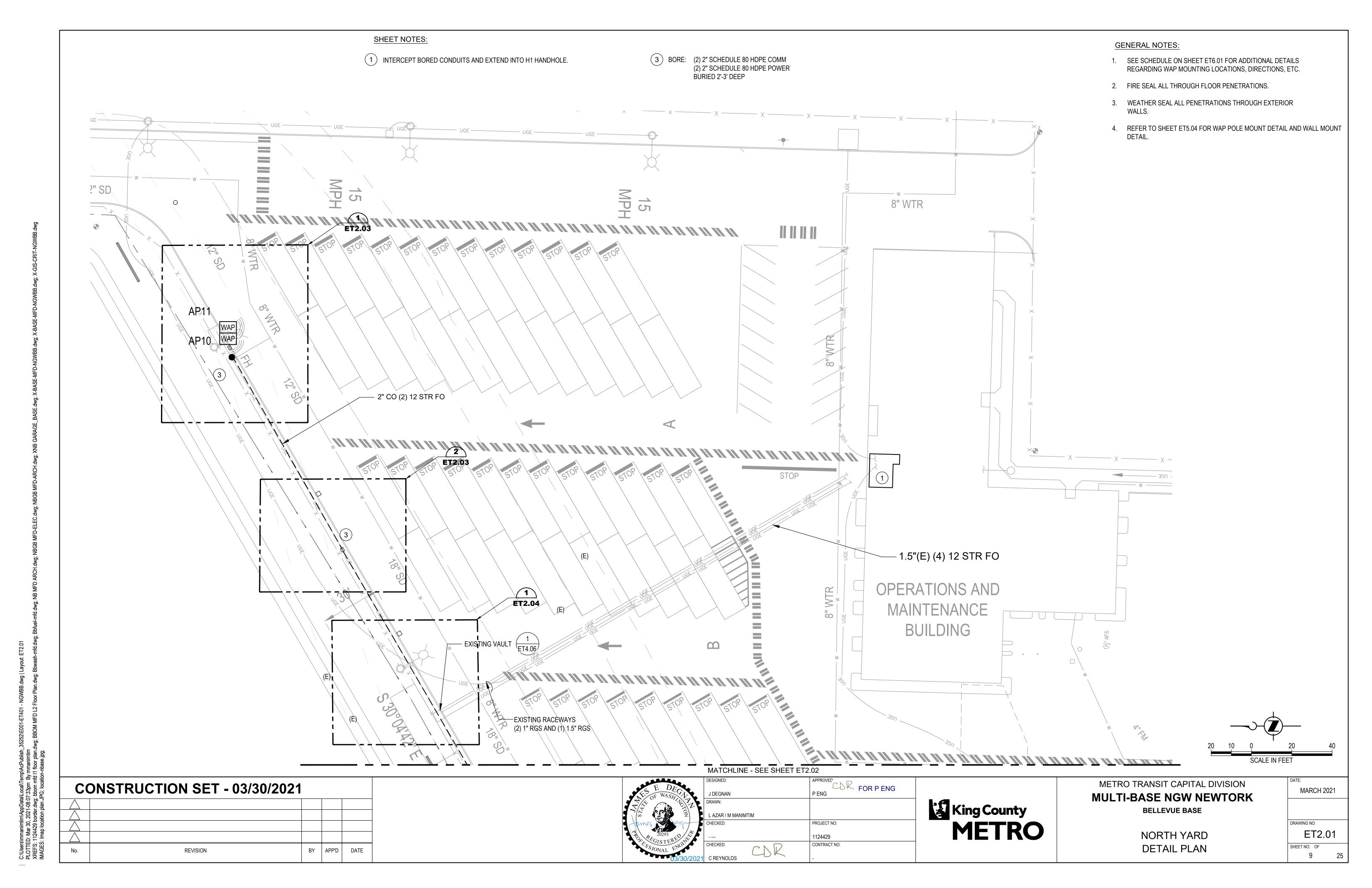
METRO

METRO TRANSIT CAPITAL DIVISION **MULTI-BASE NGW NEWTORK** BELLEVUE BASE

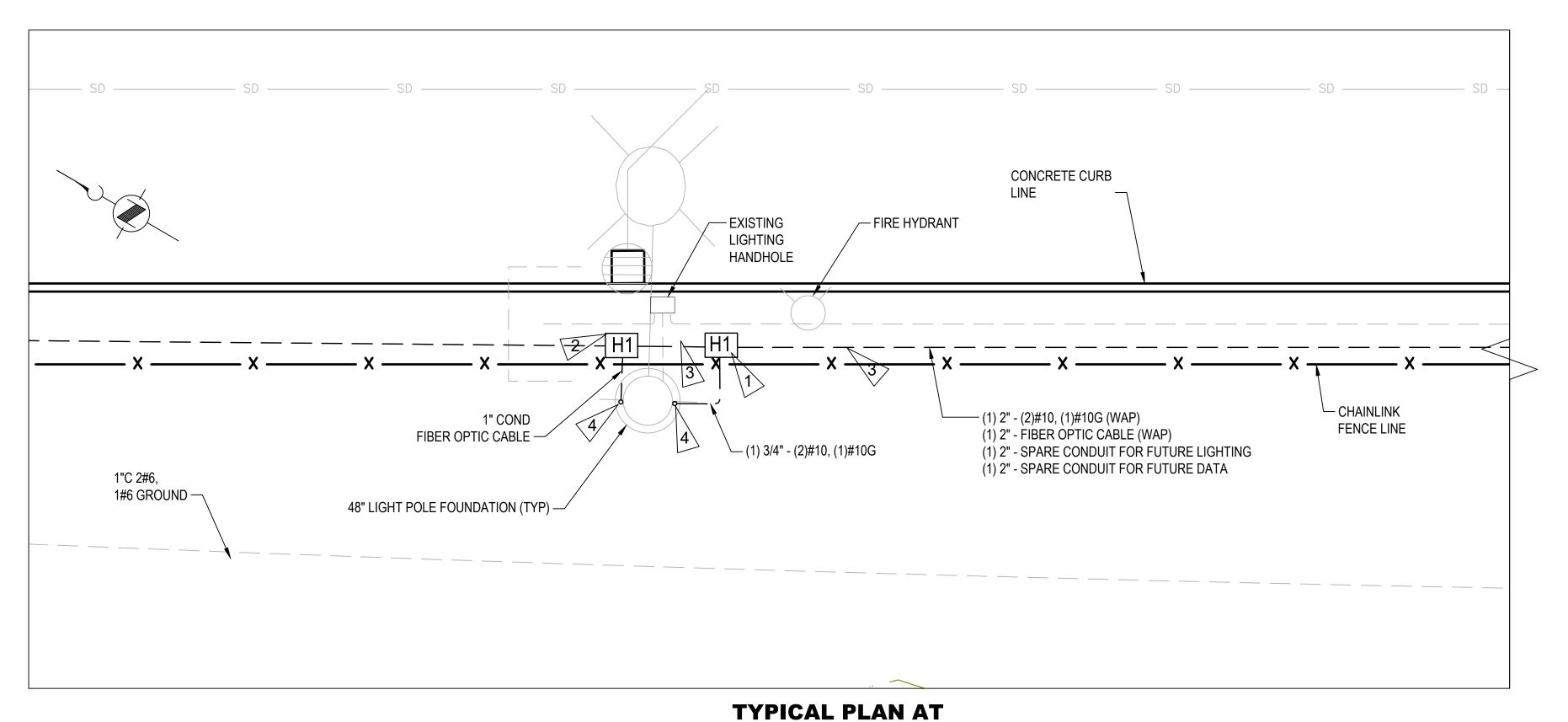
PANEL SCHEDULE

MARCH 2021 DRAWING NO:

E6.01



C:\Users\mmanimtim\AppData\Loca\\Temp\AcPublish_35252\E001-ET401 - NGWBB.dwg | Layout: ET2.02
PLOTTED: Mar 30, 2021-07:48:14pm By mmanimtim
XREFS: 1124429 border.dwg: bbom mfd I1 floor plan.dwg: BBOM MFD L2 Floor Plan.dwg: Bbwash-mfd.dwg: NB MFD ARCH.dwg: NBGB MFD-ELEC.dwg: N

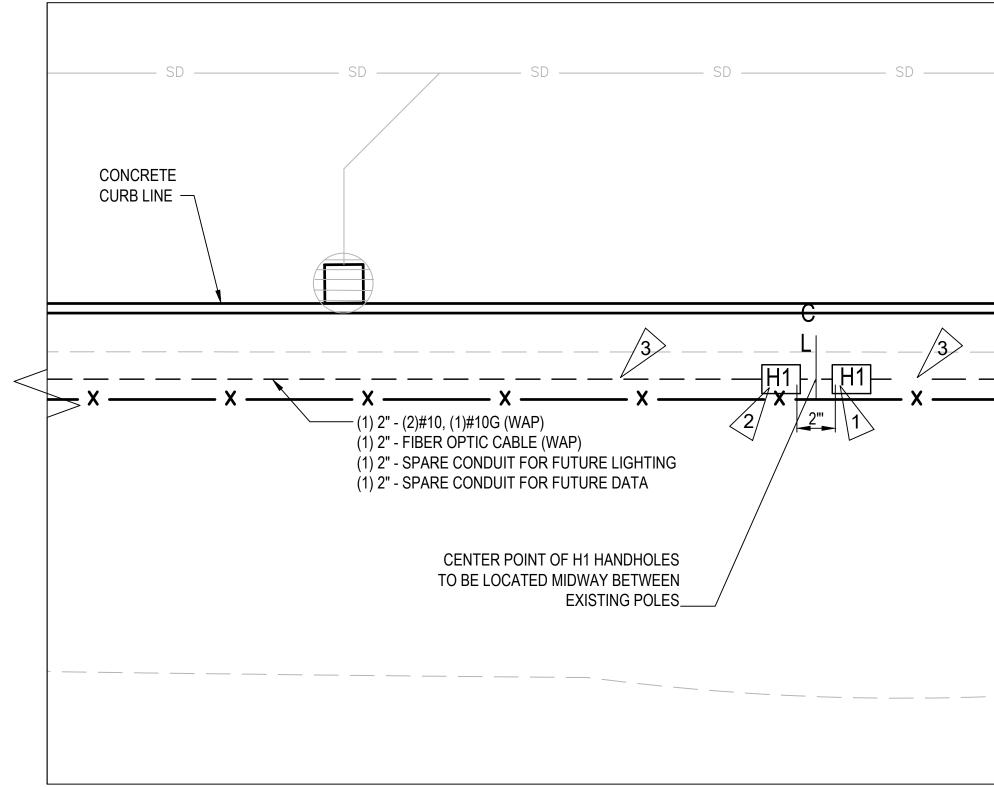


EXISTING LIGHT POLES

ET2.03

PLAN

SCALE: 1"=5'-0"



TYPICAL PLAN AT FUTURE LIGHT POLES

2 PLAN SCALE: 1"=5'-0"

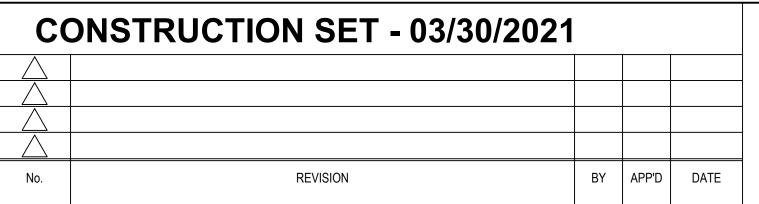
FLAG NOTES:

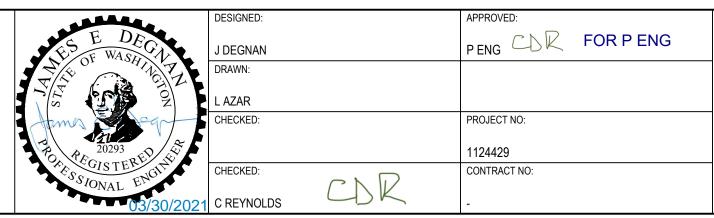
INTERCEPT BORED POWER CONDUIT AND EXTEND INTO H1 BOX.

2 INTERCEPT BORED COMMUNICATIONS CONDUIT AND EXTEND INTO H1 BOX.

3 BORED CONDUITS OFFSET AROUND EXISTING UTILITIES AND STRUCTURES.

4 STRAP RACEWAY TO OUTSIDE OF POLE.







METRO TRANSIT CAPITAL DIVISION

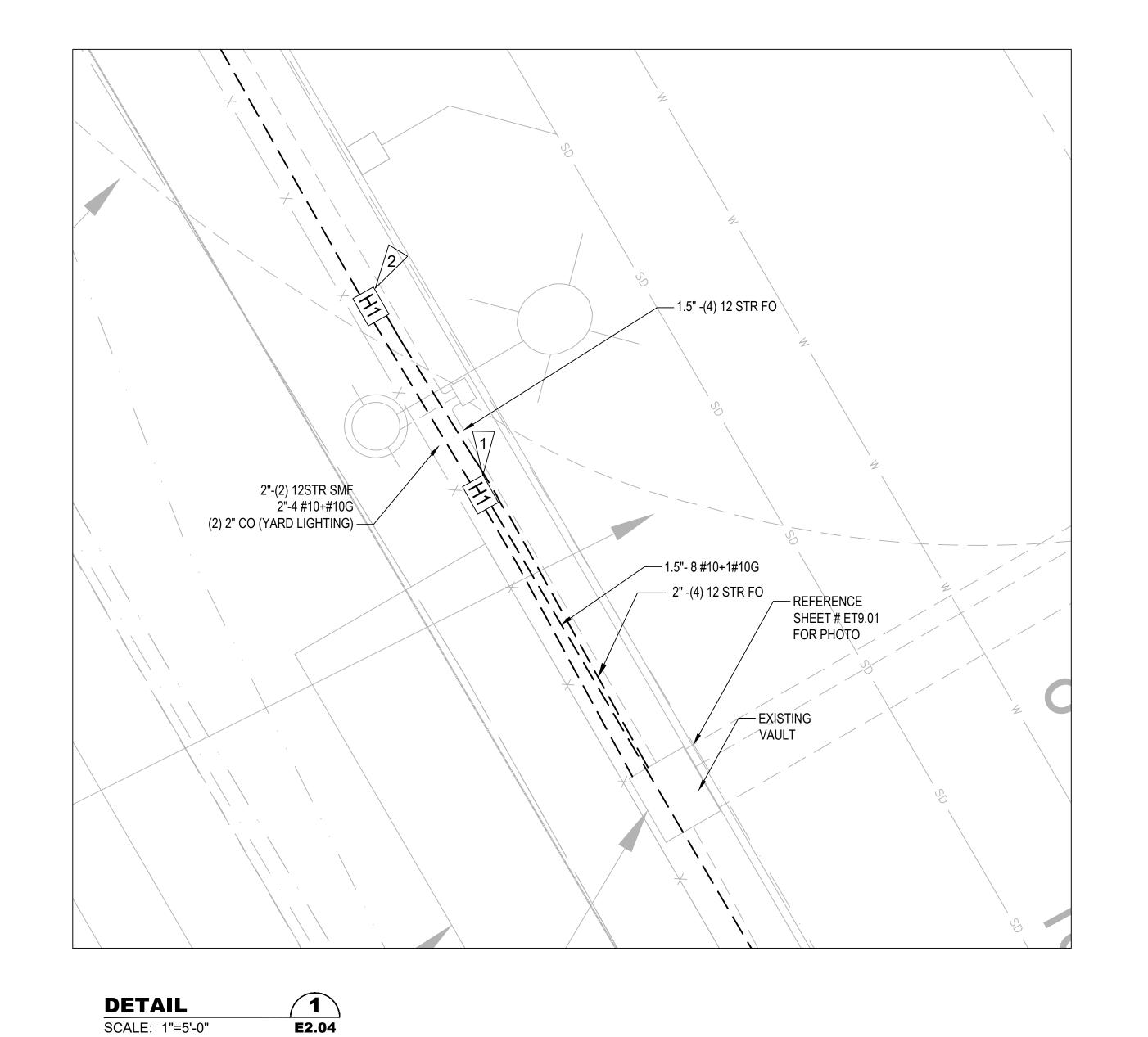
MULTI-BASE NGW NEWTORK

BELLEVUE BASE ELECTRICAL YARD PLAN DETAILS MARCH 2021

SCALE IN FEET

DRAWING NO: ET2.03

SHEET NO: OF 11



FLAG NOTES:

INTERCEPT BORED POWER CONDUIT AND EXTEND

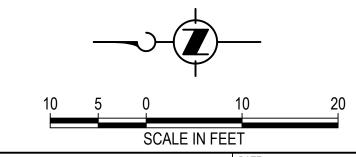
INTO H1 BOX.

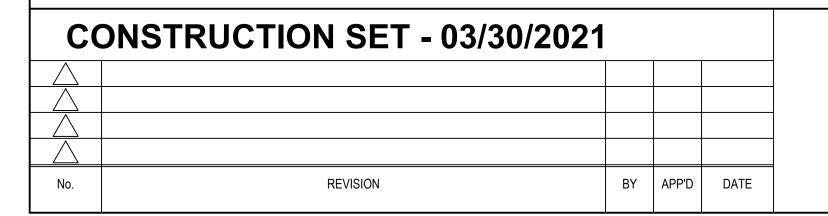
INTERCEPT BORED COMMUNICATIONS CONDUIT AND

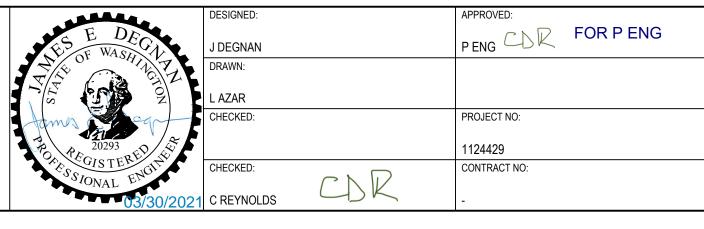
EXTEND INTO H1 BOX.

BORED CONDUITS OFFSET AROUND EXISTING

UTILITIES AND STRUCTURES.









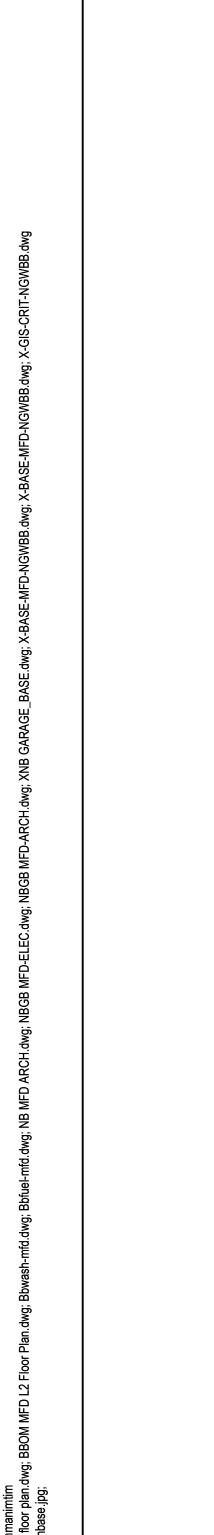
METRO TRANSIT CAPITAL DIVISION

MULTI-BASE NGW NEWTORK BELLEVUE BASE ELECTRICAL YARD PLAN DETAILS

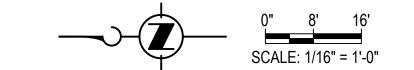
MARCH 2021

DRAWING NO: ET2.04

SHEET NO: OF 12



FLAG NOTES: **GENERAL NOTES:** 1. SEE SCHEDULE ON SHEET ET6.01 FOR ADDITIONAL DETAILS 1" EMT REGARDING WAP MOUNTING LOCATIONS, DIRECTIONS, ETC. 2 1-1/4" EMT 2. FIRE SEAL ALL THROUGH FLOOR PENETRATIONS. 3 1-1/2" EMT 3. WEATHER SEAL ALL PENETRATIONS THROUGH EXTERIOR 2" EMT (EXISTING) 4. REFER TO SHEET ET5.04 FOR WAP POLE MOUNT DETAIL AND WALL MOUNT 6 SHIELDED CAT 6A PLENUM CABLE 8 2" EMT (NEW) NEW CONDUIT RUNS FOR AP's 2, 3, 4, AND 12 WILL BE RUN IN OPEN CEILING SPACE USING A UNISTRUT TRAPEZE SYSTEM. 11 CORE FOR 1" EMT 6. NEW CABLE RUN FOR AP1 WILL BE IN DROP TILE CEILING SPACE. 12 CORE FOR 2" EMT 14 J-HOOK PATHWAY IN OPEN CEILING 16 TRANSITION FROM INDOOR/OUTDOOR CAT6A SHIELDED CABLE TO PLENUM INDOOR CAT6A SHIELDED CABLE PATHWAY FOR THE (4) FIBER CABLES — GOING OUT TO APs 8, 9, 10 AND 11 2 ET4.01 <2

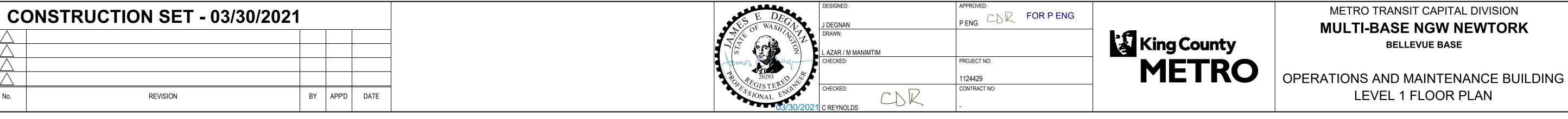


MARCH 2021

ET3.01

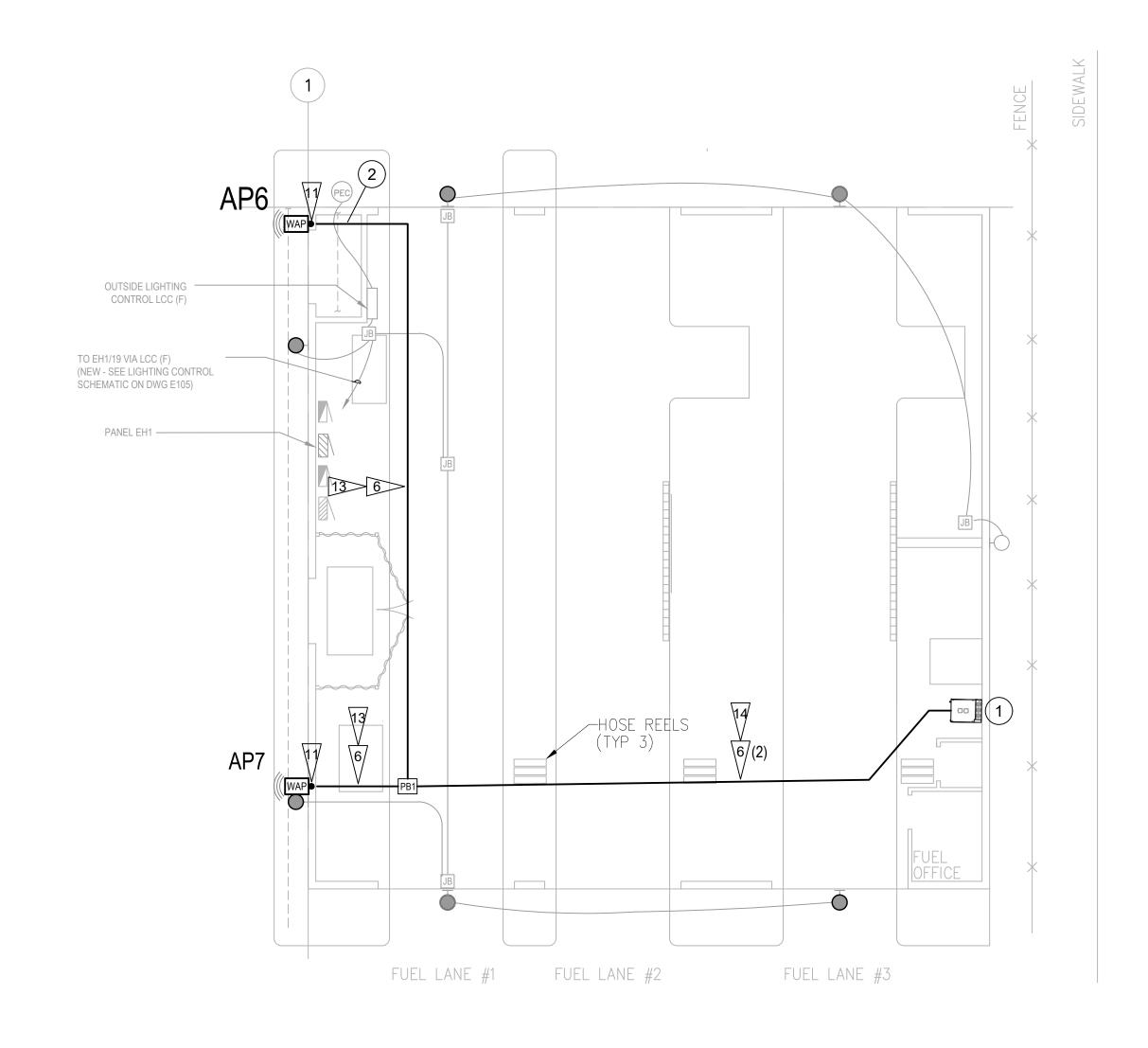
DRAWING NO:

SHEET NO: OF 13



1 ET4.01





FUEL BUILDING

PLAN SCALE: 1/8"=1'-0" ET3.21

SHEET NOTES:

- 1) NEW IDF CABINET. MOVE AND CONVERT EXISTING POWER TO QUAD OUTLET. MOVE FIBER INTO CABINET WITH RACK MOUNT FIBER PANEL
- 2 ROUTE CONDUIT OVER TOP OF HAZARDOUS ROOM AND PENETRATE OUTSIDE. PAINT OUTSIDE CONDUIT.

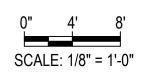
FLAG NOTES:

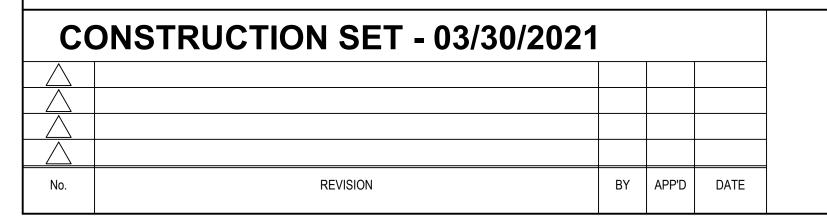
6 SHIELDED CAT 6A CABLE

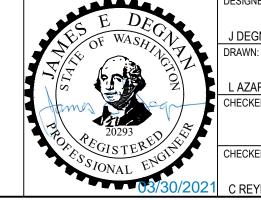
11 CORE FOR 1" EMT

1" RIGID CONDUIT

14 1.25" RIGID CONDUIT







	DESIGNED:	APPROVED:	
	J DEGNAN	PENG FOR PENG	
•	DRAWN:		ì
E	L AZAR / M MANIMTIM		1
5	CHECKED:	PROJECT NO:	ì
5		1124429	1
	CHECKED:	CONTRACT NO:	İ
21	C REYNOLDS	-	



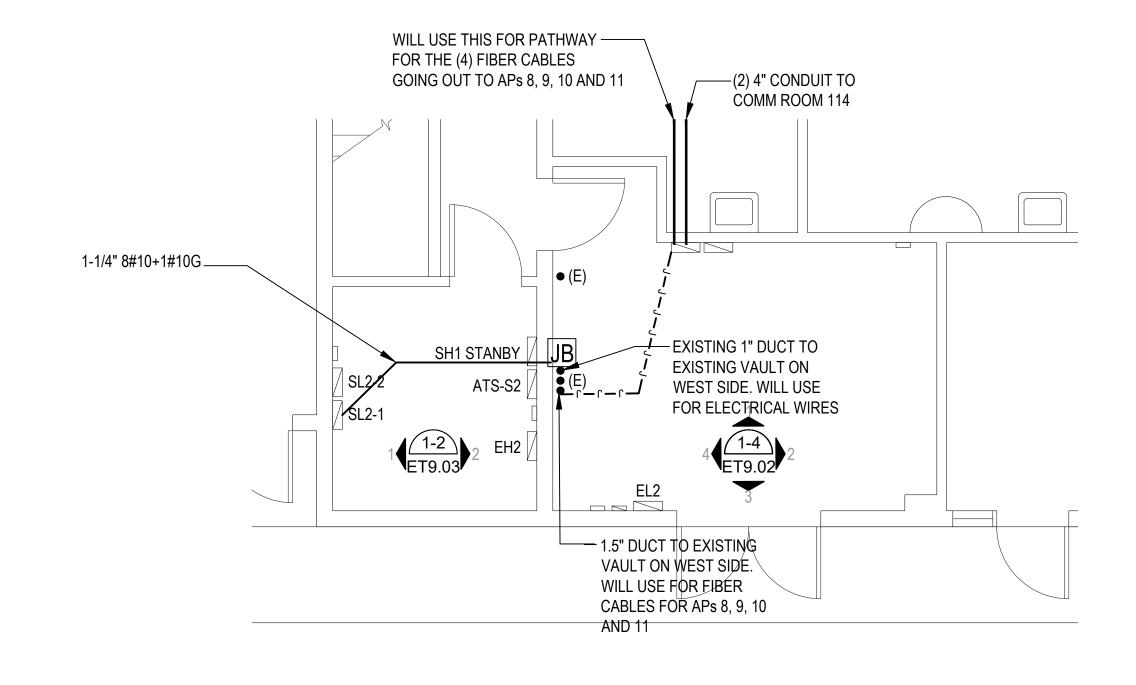
METRO TRANSIT CAPITAL DIVISION **MULTI-BASE NGW NEWTORK**

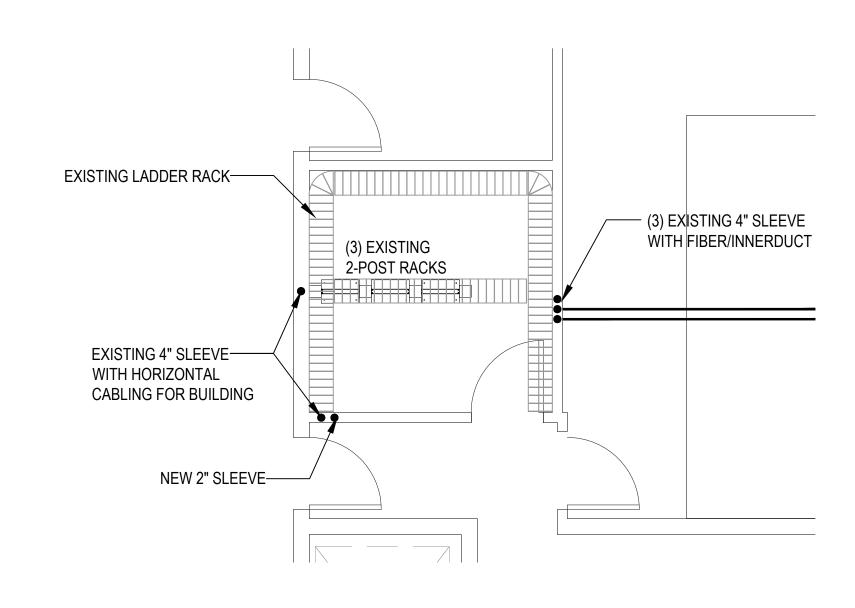
BELLEVUE BASE

FUEL BUILDING - FLOOR PLAN

MARCH 2021 DRAWING NO:

ET3.02 SHEET NO: OF 14 25





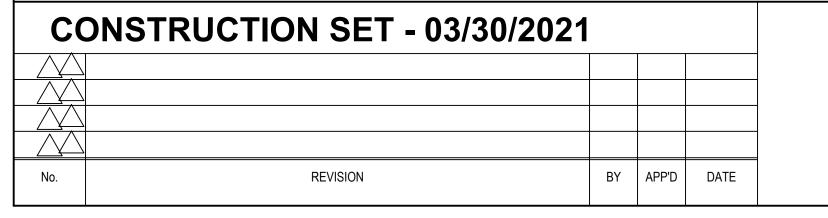
ELEC RM 117

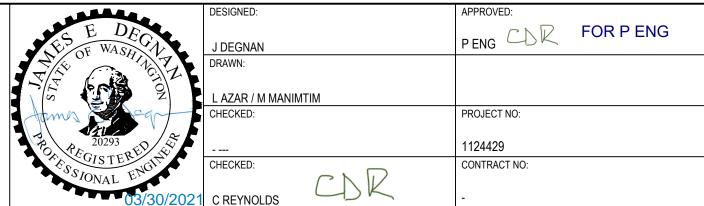
AND 135 SCALE: 1/4"=1'-0"

1 ET4.01 MAIN DISTRIBUTION FRAME PLAN

COMM RM 114 ET4.01 SCALE: 1/4"=1'-0"

START HERE







METRO TRANSIT CAPITAL DIVISION **MULTI-BASE NGW NEWTORK BELLEVUE BASE**

MDF/IDF DETAILS

MARCH 2021 DRAWING NO:

ET4.01 SHEET NO: OF 15

PROJECT NO:

1124429

CONTRACT NO:

DRAWING NO:

OPERATIONS AND MAINTENANCE BUILDING

RACK ELEVATION

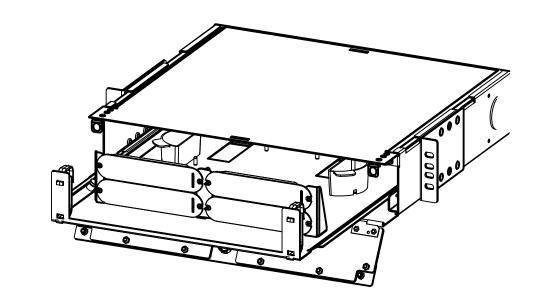
ET5.01

SHEET NO: OF

BY APP'D DATE

REVISION

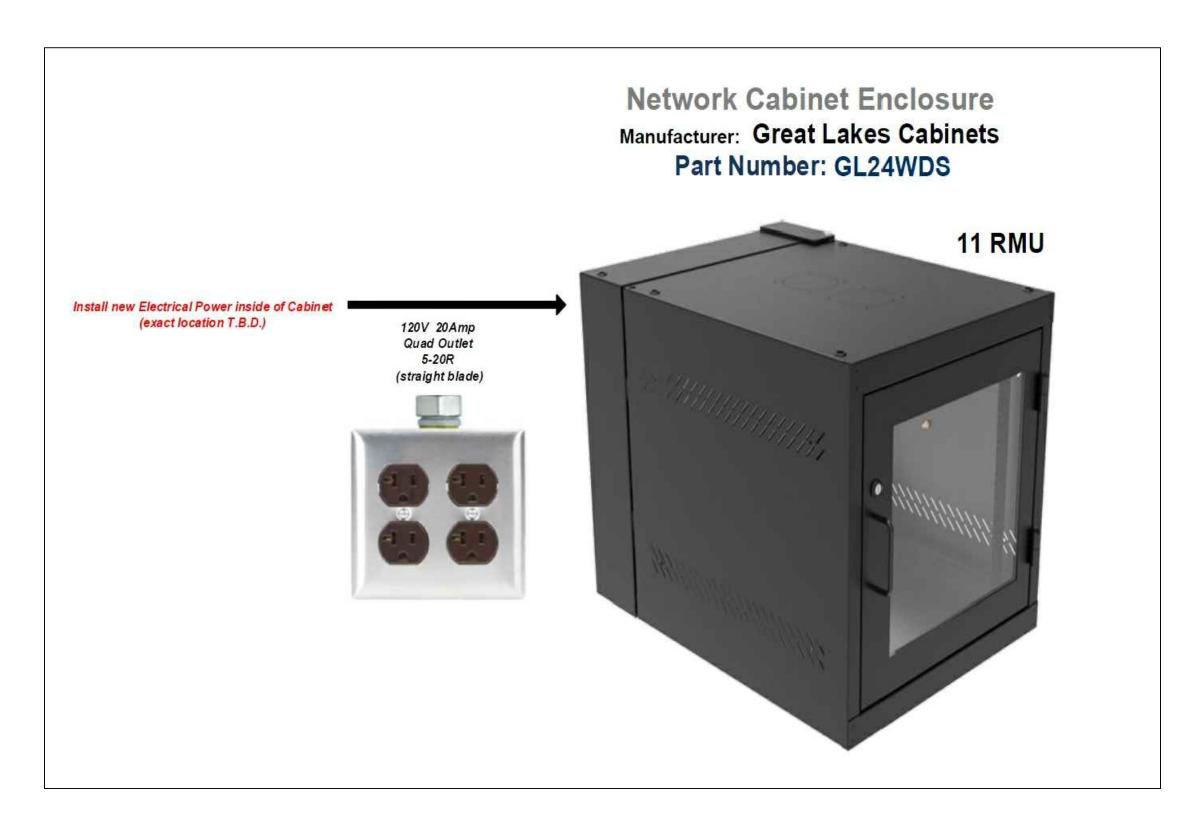
PCH-02U PRETIUM CONNECTOR HOUSING, 2U (F/4 PANELS)

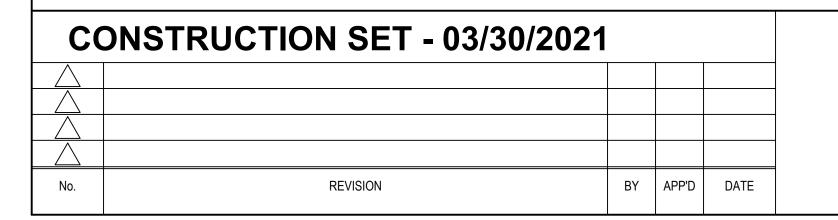


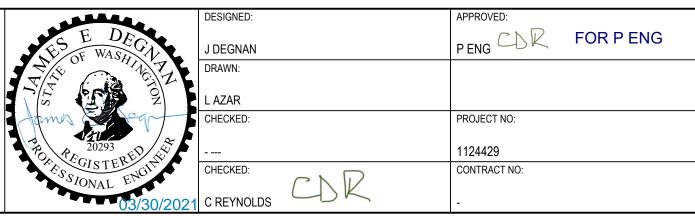
FRONT VIEW



ELEVATION 1
SCALE: NTS ET4.04









METRO TRANSIT CAPITAL DIVISION **MULTI-BASE NGW NEWTORK** BELLEVUE BASE

FUEL AND WASH BUILDING RACK ELEVATION

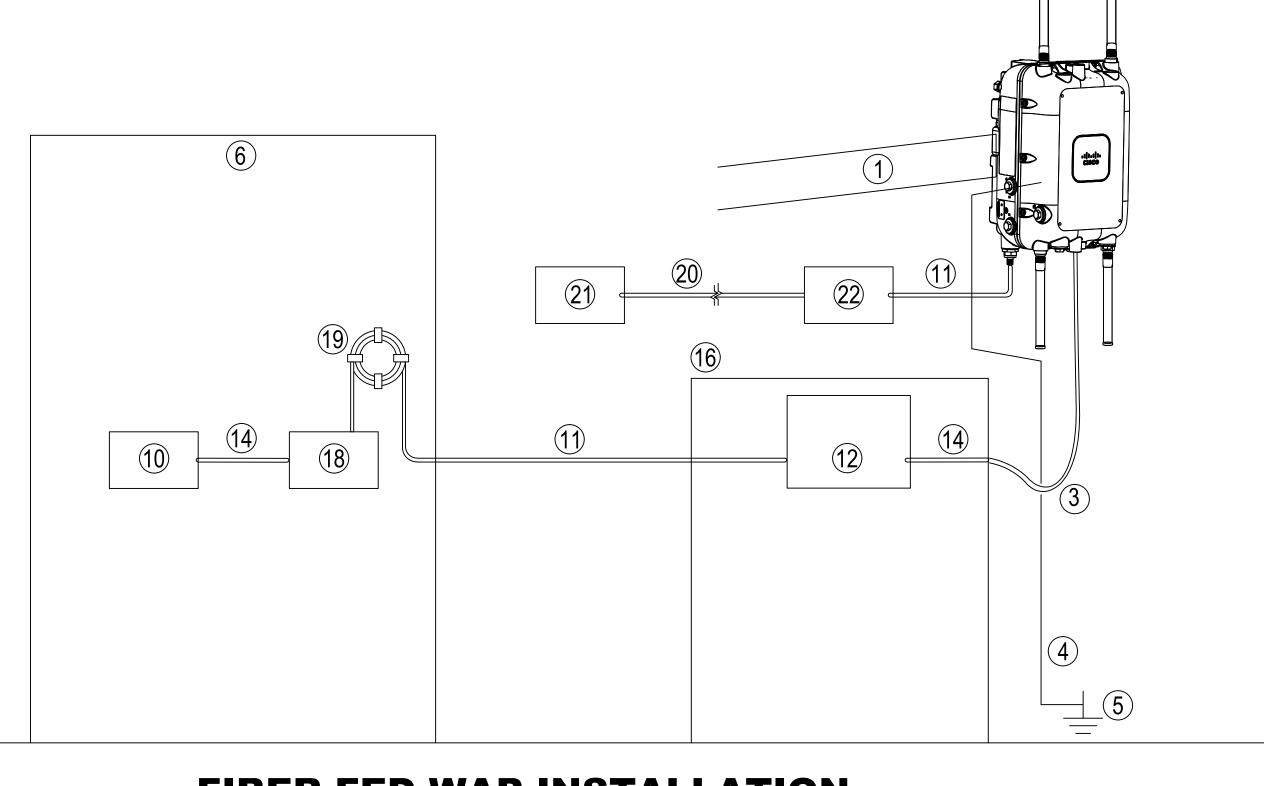
MARCH 2021 DRAWING NO:

> ET5.02 SHEET NO: OF 17

COPPER FED WAP INSTALLATION

DETAIL
SCALE: NTS

START HERE



FIBER FED WAP INSTALLATION

DETAIL 2
SCALE: NTS

INSTALLATION NOTE:

IF THE AP IS MOUNTED ABOVE THE BUILDING AND/OR ON A LIGHT POLE AND IS FED FROM A CAT6A SHIELDED COPPER CABLE THEN A LIGHTNING SUPPRESSOR NEEDS TO BE INSTALLED AS SOON AS POSSIBLE WHEN CABLE ENTERS THE BUILDING.

TYPICAL ACCESS POINT INSTALLATION COMPONENTS

THE ACCESS POINT IS DESIGNED TO BE INSTALLED IN AN OUTDOOR ENVIRONMENT, SUCH AS ON EXTERIOR WALLS, OFF CABLE STRANDS, AND ON VERTICAL AND HORIZONTAL POLES, SUCH AS STREETLIGHT POLES. CAREFULLY REVIEW FIGURE(S) 1&2/ET5.01 TO BECOME FAMILIAR WITH THE SYSTEM COMPONENTS, CONNECTORS, INDICATORS, CABLES, SYSTEM INTERCONNECTION, AND GROUNDING.

NOTES:

THE ILLUSTRATIONS IN THIS DOCUMENT SHOW ALL AVAILABLE CONNECTIONS FOR THE ACCESS POINT. UNUSED CONNECTIONS ARE CAPPED WITH A CONNECTOR PLUG TO ENSURE THE WATERTIGHT INTEGRITY OF THE ACCESS POINT, EXCEPT FOR THE AC POWER ENTRY CONNECTOR ON THE IN AP1572EAC VERSION ACCESS POINT. LIQUID-TIGHT ADAPTERS ARE PROVIDED FOR CONNECTOR OPENINGS, WHICH CAN BE INSTALLED BEFORE OR AFTER DEPLOYING THE ACCESS POINT.

WHEN NOT USING THE AC INPUT CONNECTOR TO POWER THE IN AP1572EAC VERSION (FOR EXAMPLE WHEN POWERING USING THE CISCO POWER INJECTOR), IT IS IMPORTANT TO COVER THE AC POWER ENTRY CONNECTOR. THE CORRECT CAP IS REMKE PART NUMBER 75-0086 (HTTP://WWW.REMKE.COM/). THIS CAP IS INCLUDED WITH THE AIR-PWRINJ1500-2= POWER INJECTOR. IF YOU ARE USING POE DIRECTLY FROM A SWITCH OR POWERING VIA DC, THEN YOU WILL NEED TO ORDER AIR-ACC15-AC-CAP=.

- - MOUNTED.

 2 SHIELDED INDOOR/OUTDOOR ETHERNET

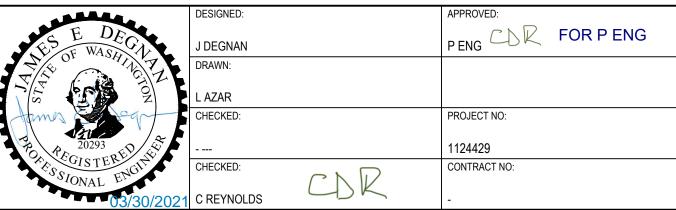
1 POLE OR WALL ON WHICH AP IS VERTICALLY

- CAT6A CABLE

 WATER DRIP LOOP
- (4) 6-AWG COPPER GROUNDING WIRE
- **5** BUILDING GROUND
- 6 IDF
- 7 NOT USED
- **8** LIGHTNING ARRESSTOR
- 9 SHIELDED ETHERNET CAT6A PATCH CABLE
- (10) CONTROLLER (THROUGH A SWITCH)

- 11 12 STRAND SINGLE MODE FIBER OPTIC CABLE, INDOOR/OUTDOOR
- 12 STRAND FIBER OPTIC PANEL W/ LC CONNECTORS
- 13 NOT USED
- 14) 2 STRAND SINGLE MODE LC/LC PATCH CORD
- 15 NOT USED
- 00 OUTDOOR WEATHER TIGHT ENCLOSURE, MOUNTED IN
- CLOSE PROXIMITY TO WAP
 CAT6A SHIELDED PATCH PANEL
- 18) FIBER PANEL
- 19 MINIMUM 20' SLACK LOOP ON AP CABLES; 12 STRAND FIBER CABLE AND CAT 6A SHIELDED CABLES IN COMM ROOM.
- 20 #12 AWG WIRE

C	ONSTRUCTION SET - 03/30/2021			
\triangle				
No.	REVISION	BY	APP'D	DATE





METRO TRANSIT CAPITAL DIVISION

MULTI-BASE NGW NEWTORK

BELLEVUE BASE

AP INSTALLATION DETAILS

DRAWING NO:

ET5.03

SHEET NO: OF

18 25

MARCH 2021

21) POWER PANEL IN BUILDING

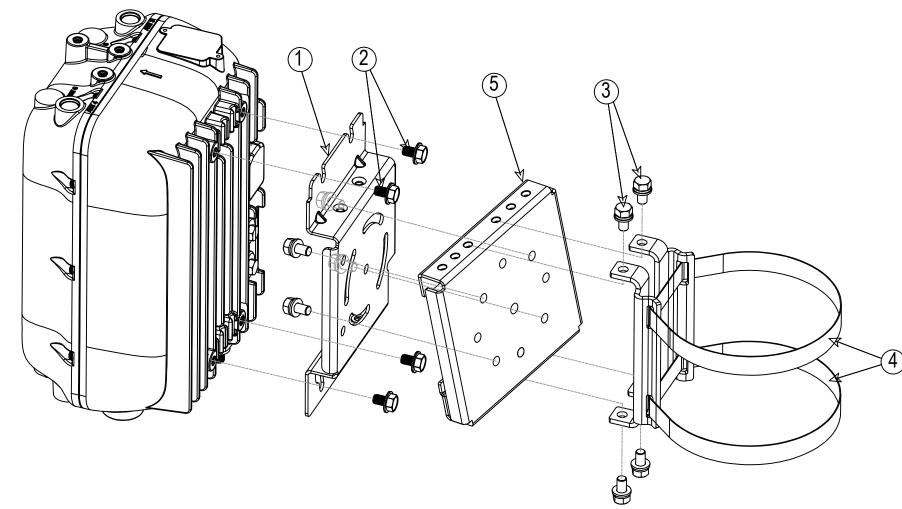
22) 4"X4"X2.5" BELL BOX

- ① M8X12MM STAINLESS STEEL BOLTS, USED ⑥ CISCO ANTENNA 11.8"H X 7.9"W X 6.3"D TO FASTEN THE AP TO THE PMK2 WALL MOUNT BRACKET
- POLE
- 3 STAINLESS STEEL BAND STRAPS
- 4 PIVOT BRACKET
- 5 M8X16MM STAINLESS STEEL BOLTS USED TO ATTACH THE STRAP BRACKETS TO THE PIVOT BRACKET. THE STRAP BRACKETS ARE SET FOR POLE OF 6 TO 11 INCHES DIAMETER, AND THE PIVOT BRACKET IS IN VERTICAL ORIENTATION.
- 7 CORNING STAINLESS STEEL ENCLOSURE 12.5"H X 10.5"W X 6.25"D
- 8 1" RGS CONDUIT FROM JUNCTION BOX
- (9) EATON FSS3 BOX WITH DS100G COVER FOR ELECTRICAL WIRES. FS BOX 6 9/32"H X 2 3/4"W X 1 7/8"D
- (10) AIR-ACC-15-AC-PLGS HARD WIRED TO A 12/3 SO CORD
- 11 LC-LC SM OSP FIBER JUMPER
- (12) SO CORD GRIP CONNECTOR

POLE MOUNTED WAP

1 **DETAILS** SCALE: NTS ET5.02





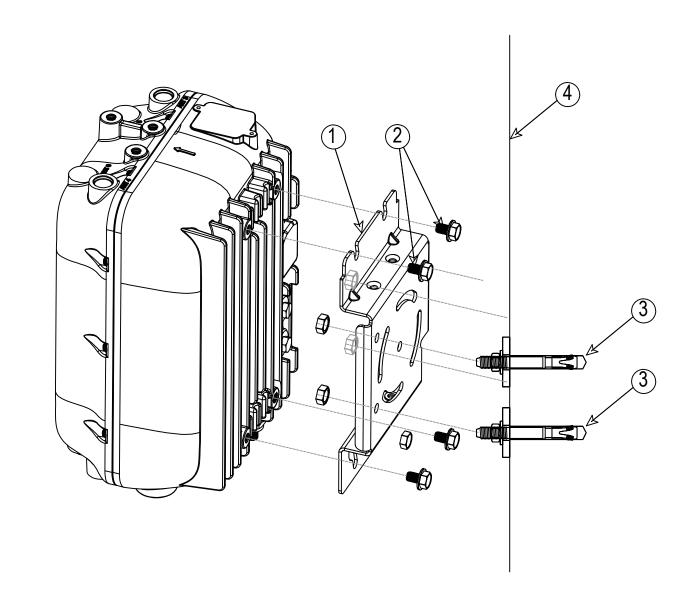
- 1) PMK2 WALL MOUNT BRACKET
- 3 M8X16MM BOLTS USED TO ATTACH THE STRAP BRACKETS TO THE WALL MOUNT BRACKET
- **5** PIVOT BRACKET

- (2) M8X12MM STAINLESS STEEL BOLTS, USED TO FASTEN THE AP TO THE PMK2 WALL MOUNT BRACKET
- 4 STAINLESS STEEL BAND STRAPS WILL BE USED. SIZE WILL BE DETERMINED BY EACH POLE THE AP WILL MOUNT TO.

POLE MOUNTED BRACKET

DETAILS	2
SCALE: NTS	ET5.02

PMK2 MOUNT WITHOUT PIVOT BRACKET FOR WALL MOUNT

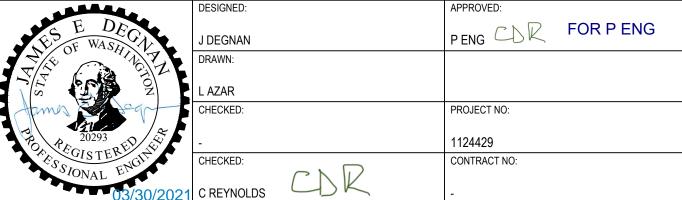


- ① PMK2 WALL MOUNT BRACKET
- ③ INSTALL HILTI SS 304 1/4"X 2-1/4" KWIK BOLT TZ EXPANSION ANCHORS RATED ~600LBS PULL PUT EACH
- ② M8X12MM STAINLESS STEEL BOLTS, USED TO FASTEN THE AP TO THE PMK2 WALL MOUNT BRACKET
- 4 WALL

WALL MOUNTING BRACKET

DETAILS	3
SCALE: NTS	ET5.02

C	ONSTRUCTION SET - 03/30/2021			
\triangle				
\triangle				
\triangle				
No.	REVISION	BY	APP'D	DATE





METRO TRANSIT CAPITAL DIVISION **MULTI-BASE NGW NEWTORK**

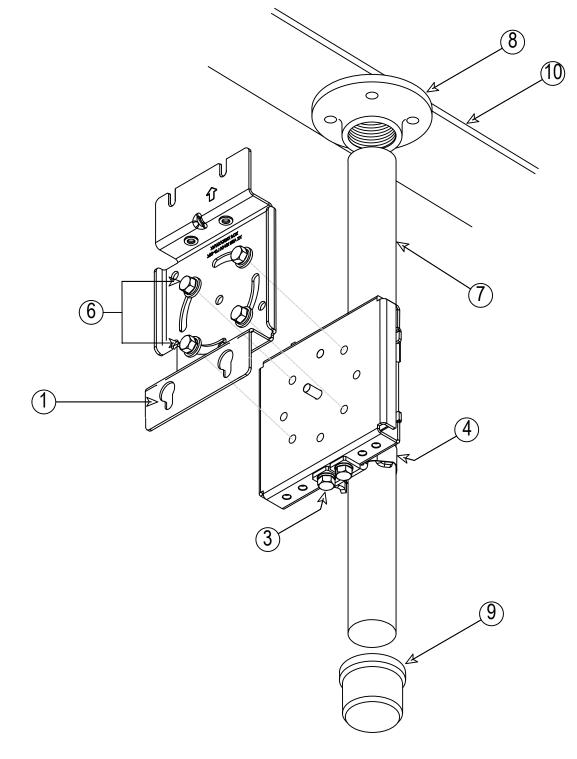
BELLEVUE BASE

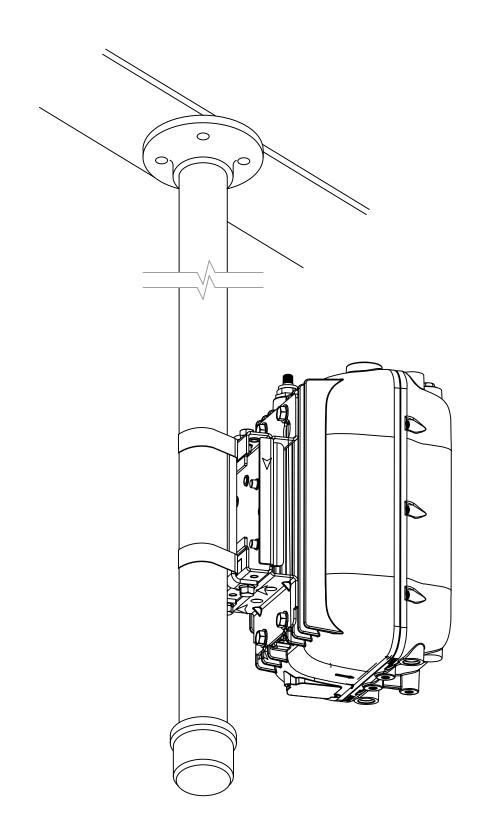
BRACKET DETAILS

DRAWING NO: ET5.04

MARCH 2021

SHEET NO: OF 19





- 1) PMK2 WALL MOUNT BRACKET
- ③ M8X16MM BOLTS USED TO ATTACH THE STRAP BRACKETS TO THE PIVOT BRACKET

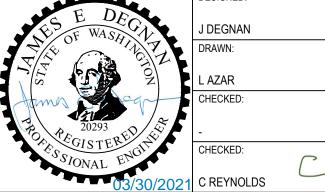
 5 PIVOT BRACKET
- 7 2" GALVANIZED PIPE LENGTH TO BE DETERMINED IN FIELD AND CAPPED OFF WITH 2" PIPE END CAP
- 9 2" PIPE END CAP

- 2 M8X12MM STAINLESS STEEL BOLTS, USED TO FASTEN THE AP TO THE PMK2 WALL MOUNT BRACKET
- 4 STAINLESS STEEL BAND STRAPS WILL BE USED. SIZE WILL BE DETERMINED BY EACH POLE THE AP WILL MOUNT TO.
- 6 M8X16MM BOLTS USED TO MOUNT THE WALL MOUNT BRACKET ON THE PIVOT BRACKET.
- 8 2" PIPE FLOOR FLANGE, MOUNTED TO THE RED IRON WITH 4 X 3/8" BEAM CLAMPS
- 10 RED IRON BEAM OR UNISTRUT

CEILING (PIPE) MOUNTED WAP

1 **DETAILS** SCALE: NTS ET5.06

CONSTRUCTION SET - 03/30/2021 BY APP'D DATE REVISION



	DESIGNED:	APPROVED:
فو	J DEGNAN	PENG FOR PENG
Z	DRAWN:	
	L AZAR	
7	CHECKED:	PROJECT NO:
	-	1124429
	CHECKED:	CONTRACT NO:
/2021	C REYNOLDS	_



METRO TRANSIT CAPITAL DIVISION **MULTI-BASE NGW NEWTORK**

BELLEVUE BASE

CEILING (PIPE) MOUNTED WAP DETAILS

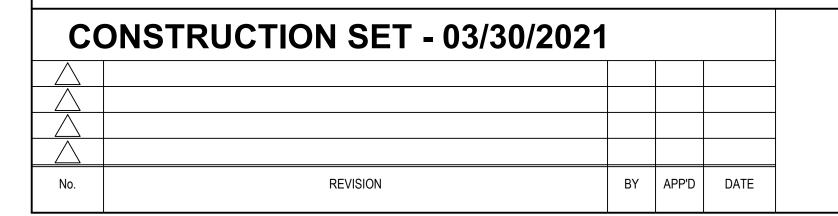
MARCH 2021 DRAWING NO: ET5.05

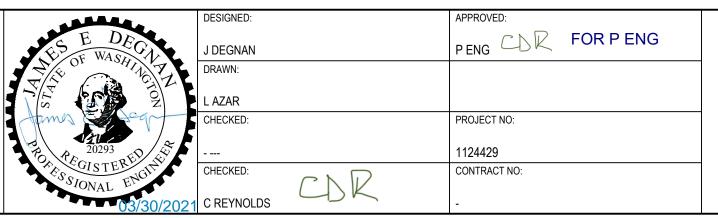
SHEET NO: OF 20

AP#	AP MODEL	ANTENNA DIRECTION	DOWN-TILT	LOCATION	BRACKET TYPE	NOTES	MOUTING HEIGHT	CABLE REQ	ADDITIONAL MOUNTING DETAILS	DETAIL / PAGE REFERENCE
1	DIRECTIONAL	STRAIGHT-OUT	1°	WEST SIDE OF OPERATIONS AND MAINTENANCE BUILDING	WALL	EXTERIOR CONCRETE WALL	14	CAT6A SHIELDED	ROUTE IN DROP TILE CEILING WITH J-HOOKS FROM THE CORE PENETRATION TO THE COMM ROOM.	SEE SHEET ET5.03 DETAIL 1. SEE SHEET ET504. DETAIL 3.
2	DIRECTIONAL	STRAIGHT-OUT	1°	WEST SIDE OF OPERATIONS AND MAINTENANCE BUILDING	WALL	EXTERIOR CONCRETE WALL	14	CAT6A SHIELDED	MOUNT TO THELLEFT OF BAY 1	SEE SHEET ET5.03 DETAIL 1. SEE SHEET ET504. DETAIL 3.
3	DIRECTIONAL	STRAIGHT-OUT	1°	WEST SIDE OF OPERATIONS AND MAINTENANCE BUILDING	WALL	EXTERIOR CONCRETE WALL	14	CAT6A SHIELDED	MOUNT BETWEEN BAY 3 AND BAY 4	SEE SHEET ET5.03 DETAIL 1. SEE SHEET ET504. DETAIL 3.
4	DIRECTIONAL	240°	l°	WEST SIDE OF OPERATIONS AND MAINTENANCE BUILDING	WALL	EXTERIOR CONCRETE WALL	14	CAT6A SHIELDED	MOUNT TO THE RIGHT OF BAY 4	SEE SHEET ET5.03 DETAIL 1. SEE SHEET ET504. DETAIL 3.
5	OMNI	0	0	SOUTH-EAST SIDE OF OPERATOINS AND MAINTENANCE BUILDING	WALL	EXTERIOR CONCRETE WALL	12	CAT6A SHIELDED		SEE SHEET ET5.03 DETAIL 1. SEE SHEET ET504. DETAIL 3.
6	DIRECTIONAL	STRAIGHT-OUT	1°	NORTH-WEST SIDE OF FUEL/WASH BUILDING	WALL	EXTERIOR CONCRETE WALL	14	CAT6A SHIELDED	ROUTE 1" RIGID CONDUIT OVER THE TOP OF THE HAZARDOUS ROOM INSTEAD OF GOING THROUGH THE HAZARDOUS ROOM. THEN PENETRATE A 1" HOLE TO EXTERIOR OF BUILDING.	SEE SHEET ET5.03 DETAIL 1. SEE SHEET ET504. DETAIL 3.
7	DIRECTIONAL	STRAIGHT-OUT	1°	SOUTH-WEST SIDE OF FUEL/WASH BUILDING	WALL	EXTERIOR CONCRETE WALL	14	CAT6A SHIELDED		SEE SHEET ET5.03 DETAIL 1. SEE SHEET ET504. DETAIL 3.
8	DIRECTIONAL	360°	1°	SOUTH-WEST CORNER OF PROPERTY LINE	POLE	LIGHT POLE	16	12 STRAND SM FIBER	ATTACH (2) 1" RGS TO CURB WITH STAINLESS STEEL CHANNEL SUPPORT APPROX 50' FROM LIGHT POLE TO FENCE.	SEE SHEET ET5.03 DETAIL 2. SEE SHEET ET504. DETAIL 1. SEE SHEET ET5.04 DETAIL 2
9	DIRECTIONAL	60°	1°	WEST SIDE OF PROPERTY LINE	POLE	LIGHT POLE	13	12 STRAND SM FIBER		SEE SHEET ET5.03 DETAIL 2. SEE SHEET ET504. DETAIL 1. SEE SHEET ET5.04 DETAIL 2
10	DIRECTIONAL	NEED INFORMATION	??	NORTH WEST CORNER OF PROPERTY LINE (SAME AS AP 11)	POLE	LIGHT POLE	16	12 STRAND SM FIBER	MOUNT ON SAME LIGHT POLE AT AP11	SEE SHEET ET5.03 DETAIL 2. SEE SHEET ET504. DETAIL 1. SEE SHEET ET5.04 DETAIL 2
11	DIRECTIONAL	NEED INFORMATION	??	NORTH WEST CORNER OF PROPERTY LINE (SAME AS AP 10)	POLE	LIGHT POLE	16	12 STRAND SM FIBER	MOUNT ON SAME LIGHT POLE AT AP10	SEE SHEET ET5.03 DETAIL 2. SEE SHEET ET504. DETAIL 1. SEE SHEET ET5.04 DETAIL 2
12	OMNI	0	0	OPERATIONS AND MAINTENANCE BUILDING MAINTENANCE AREA, ABOVE TOOL BOX CAGE	POLE	ABOVE TOOL BOX CAGE	10	CAT6A SHIELDED	MOUNT ON UNISTRUT ABOVE TOOL BOX CAGE	SEE SHEET ET5.03 DETAIL 1. SEE SHEET ET504. DETAIL 3.

NOTE:

1. HEIGHT AFF IS TO BOTTOM OF ANTENNA







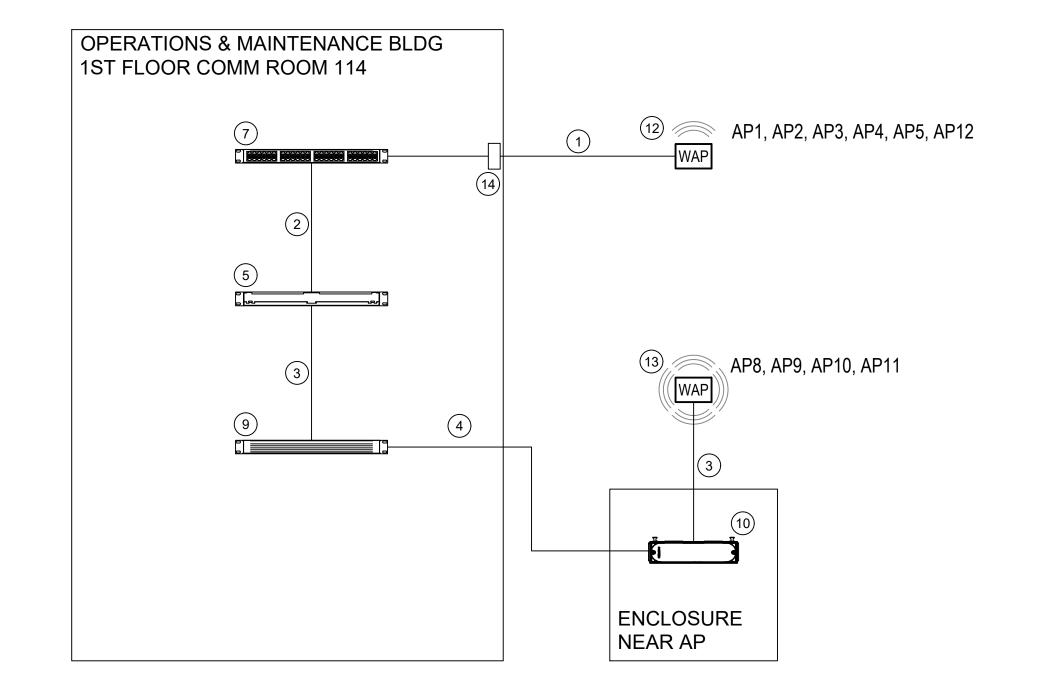
METRO TRANSIT CAPITAL DIVISION **MULTI-BASE NGW NEWTORK**

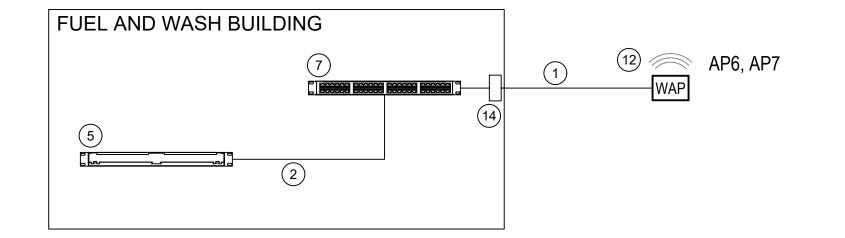
BELLEVUE BASE

MARCH 2021 DRAWING NO:

AP INSTALLATION SCHEDULE

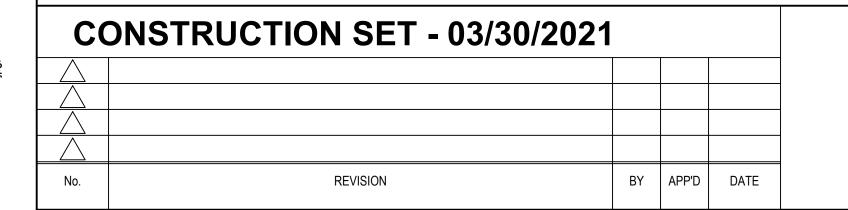
ET6.01 SHEET NO: OF 21 25

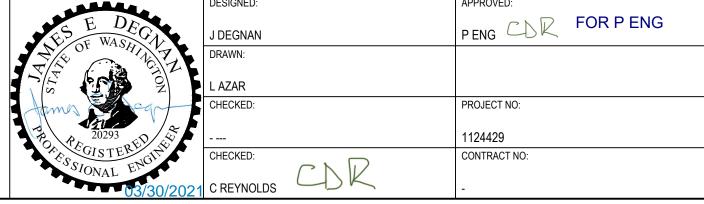




SYMBOL / CABLE TYPE ID KEY:

- 1) SHIELDED CAT 6A CABLE
- (2) SHIELDED CAT 6A PATCH CABLE
- 3 2 STRAND SM FIBER JUMPERS
- 4 12 STRAND SM FIBER CABLES FOR APs
- 5 NETWORK SWITCH
- (6) NOT USE
- 7) 48 PORT SHIELDED CAT6A PATCH PANEL
- 8 NOT USED
- 9 FIBER PANEL WITH 12 STRAND AP FIBER CABLES
- 10 FIBER PANEL
- 11) NOT USED
- (12) CAT6A FED AP
- 13 FIBER FED AP
- 14 LIGHTNING SUPPRESSOR







METRO TRANSIT CAPITAL DIVISION

MULTI-BASE NGW NEWTORK
BELLEVUE BASE

RISER DIAGRAM

DRAWING NO:
ET6.02

MARCH 2021

SHEET NO: OF 22 25

Existing Vault With Conduits From Electrical Room 117



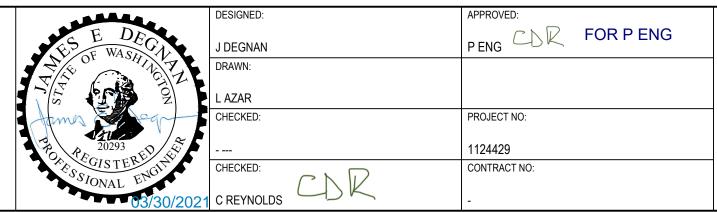
NOTES:

INSTALL AN LB OVER THE 1.5" CONDUIT AND EXTEND A NEW CONDUIT OUT THROUGH THE WALL OF THE VAULT FOR POWER AND COMM.

CLEAN CONDUIT ENDS.

TERMINATE FIBER CONDUIT WITH NEW BRUSHING

INSTRUCTION SET - 03/30/2021			
REVISION	BY	APP'D	DATE
		ONSTRUCTION SET - 03/30/2021 REVISION BY	





METRO TRANSIT CAPITAL DIVISION **MULTI-BASE NGW NEWTORK**

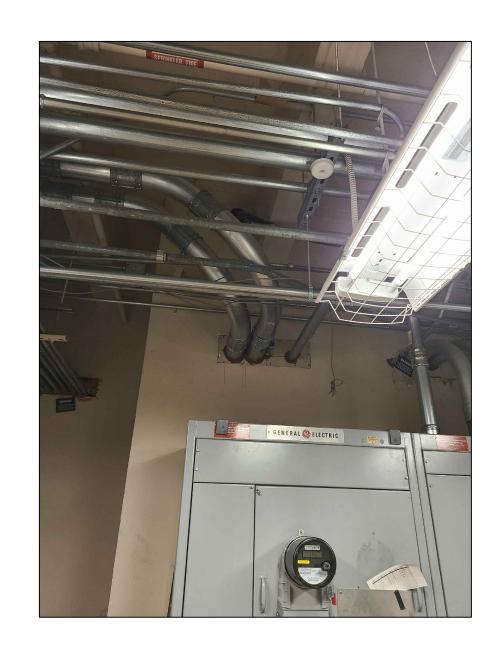
BELLEVUE BASE

EXISTING VAULT

MARCH 2021

DRAWING NO: ET9.01

SHEET NO: OF



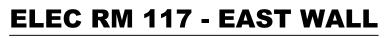








ELEC RM 117 - SOUTH WALL 2 **ELEVATION** SCALE: NTS ET4.07



ELEVATION SCALE: NTS

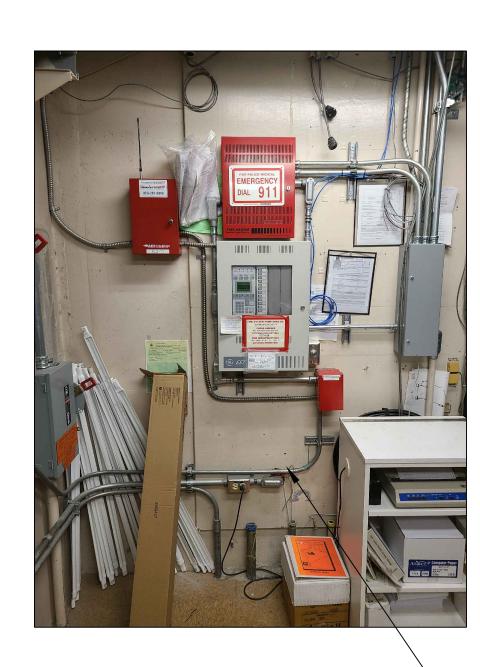
ET4.07



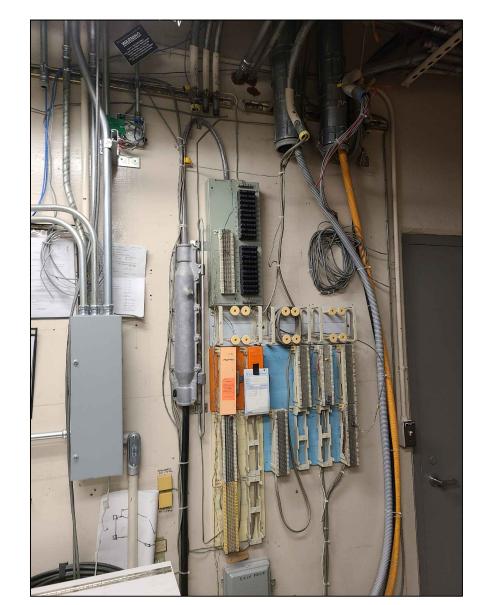
ELEC RM 117 - WEST WALL

ELEVATION SCALE: NTS

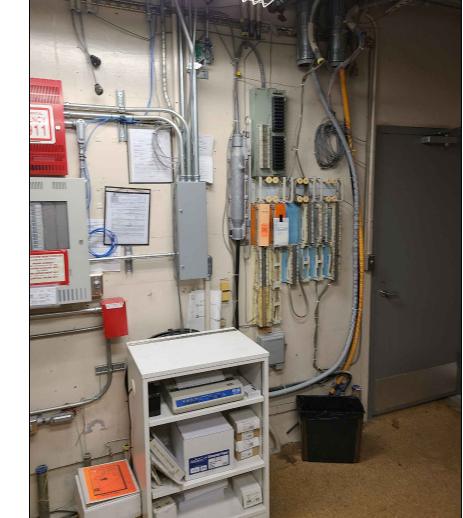




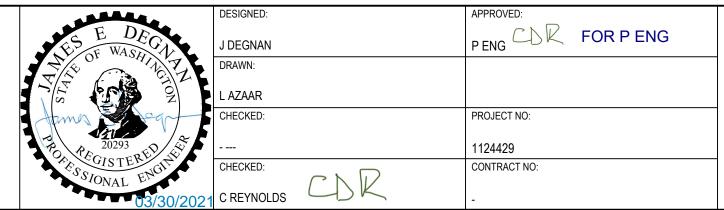
EXTEND POWER WIRING IN CONDUIT — TO PANEL AND FIBER TO MDF VIA J HOOKS PER PLANS AND SCHEDULE



ELEC RM 117 - NORTH WALL 4 ET4.07 ELEVATION
SCALE: NTS



C	ONSTRUCTION SET - 03/30/2021)/2021			
\triangle					
\triangle					
\triangle					
\triangle					
No.	REVISION	BY	APP'D	DATE	





METRO TRANSIT CAPITAL DIVISION **MULTI-BASE NGW NEWTORK**

BELLEVUE BASE

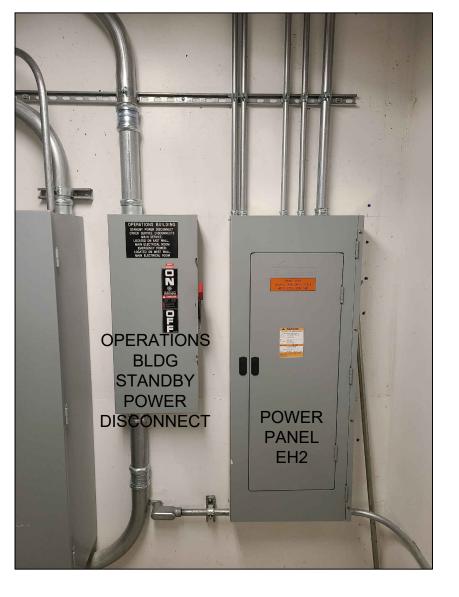
ELEC RM 117 WALL ELEVATIONS MARCH 2021

DRAWING NO: ET9.02

SHEET NO: OF 24 25









ELEC RM 135 - SOUTH WALL

ELEVATION

SCALE: NTS

ET4.08









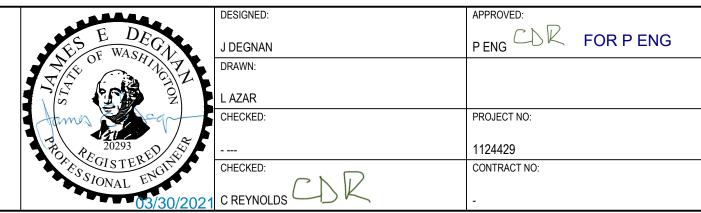
ELEC RM 135 - NORTH WALL

ELEVATION

SCALE: NTS

2 ET4.08

C	ONSTRUCTION SET - 03/30/2021			
\triangle				
\triangle				
\triangle				
\triangle				
No.	REVISION	BY	APP'D	DATE





METRO TRANSIT CAPITAL DIVISION **MULTI-BASE NGW NEWTORK** BELLEVUE BASE

> ELEC RM 135 WALL ELEVATIONS

MARCH 2021

DRAWING NO: ET9.03 SHEET NO: OF

Appendix B Washington State Department of Ecology Facility/Site index

Facility/Site: King Cnty DOT Metro Transit Bellevue 39681715

Also known as: EAST OPERATING BASE ANNEX, KING CNTY BELLEVUE OPERATING BASE,

KING CNTY DOT METRO TRANSIT BELLEVUE, KING CO TRANSIT BELLEVUE OPERATING BASE, METRO KING CNTY DOT TRANSIT BELLEVUE, METRO

TRANSIT BELLEVUE BASE



Decimal Coordinates

Latitude: 47.62611

Address Longitude: -122.17259

1790 124TH AVE NE

BELLEVUE WA 98005

Geographic Information

Ecology Region: NWRO Legislative District: 48 WRIA: 8

County: King Congressional District: 9 Tribal Land: No

Ecology Interactions

Interaction Description	Ecology Program	Ecology Program Phone	Program ID	Start Date	End Date
Haz Waste Management Activity	HAZWASTE	(360) 407-6734	WAD981766249	12/31/2016	
Hazardous Waste Generator	HAZWASTE	(360) 407-6734	WAD981766249	12/31/2015	12/31/2016
Non Enforcement Final	WATQUAL	(360) 407-6712		11/23/2015	
Haz Waste Management Activity	HAZWASTE	(360) 407-6734	WAD981766249	12/31/2013	12/31/2015
Hazardous Waste Generator	HAZWASTE	(360) 407-6734	WAD981766249	12/31/2012	12/31/2013
Haz Waste Management Activity	HAZWASTE	(360) 407-6734	WAD981766249	12/31/2009	12/31/2012
Hazardous Waste Generator	HAZWASTE	(360) 407-6734	WAD981766249	12/31/2008	12/31/2010
Haz Waste Management Activity	HAZWASTE	(360) 407-6734	WAD981766249	12/31/2005	12/31/2008
Industrial SW GP	WATQUAL	(360) 407-6400	WAR003301	7/24/1998	

LUST Facility	TOXICS	(360) 407-7224	10099	6/25/1997	1/2/1998
Emergency/Haz Chem Rpt TIER2	HAZWASTE	(360) 407-6171	WAD981766249	1/1/1992	
Hazardous Waste Planner	HAZWASTE	(360) 407-6731	WAD981766249	1/1/1991	5/1/2001
Hazardous Waste Generator	HAZWASTE	(360) 407-6734	WAD981766249	4/29/1987	12/31/2009
Underground Storage Tank	TOXICS	(360) 407-7224	10099	1/1/1984	

Industrial Codes (External Links Below)

NAICS Code	NAICS Description
<u>48511</u>	Urban Transit Systems
485113	BUS AND OTHER MOTOR VEHICLE TRANSIT

SIC Code	SIC Description
<u>4111</u>	LOCAL AND SUBURBAN TRANSIT
<u>4173</u>	BUS TERMINAL AND SERVICE FACILITIES
<u>4225</u>	GENERAL WAREHOUSING AND STORAGE

Appendix C
Washington State Department of Ecology
No Further Action Determination





STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

Northwest Regional Office, 3190 - 160th Ave S.E. • Bellevie, Washington 98008-3452 • (425) 649-7000

January 2, 1998

Robert E. Isler
Facilities Project Coordinator
King County Department of Transportation
821 Second Ave, MS 118
Seattle, WA 98104-1598

Subject:

Request for No Further Action for the Bellevue Base Facility-King County Transit Division located at 1790 – 124th Avenue NE, Bellevue, Washington

Dear Bob Isler:

Thank you for submitting the results of your independent remedial action(s) for review by the State of Washington Department of Ecology (Ecology). Ecology appreciates your initiative in pursuing this administrative option under the Model Toxics Control Act (MTCA).

Ecology's Toxics Cleanup Program has reviewed the following information regarding the Bellevue Base King County Transit Division facility located at 1790 – 124th Avenue NE, Bellevue, Washington:

- 1. Site Characterization and Cleanup Report Underground Storage Task Closure, Bellevue Base UST Replacement Project Environmental Engineering Service Contract No. CS/MS66-94 submitted December 2, 1997 and prepared by AGI Technologies.
- 2. Phase 1 Site Assessment Metro Bellevue Base Facility dated November 5, 1992 and prepared by Herrera Environmental Consultants and Enviros, Inc.

The above listed reports will be kept in the Central Files of the Northwest Regional Office (NWRO) of Ecology for review by appointment only. Appointments can be made by calling the resource contact person, Sally Perkins at 425-649-7190.

Based upon the above listed information Ecology has determined that, at this time, the release of total petroleum hydrocarbons into the soil and ground water no longer poses a threat to human health or the environment.

Robert E. Isler
Request for No Further Action for the Bellevue Base Facilities
January 5, 1998, page 2

Therefore, Ecology is issuing this determination that no further remedial action is necessary at this site under MTCA, chapter 70.105D RCW. However, please note that because your actions were not conducted under a consent decree with Ecology, this letter is not a settlement by the state under RCW 70.105D.040(4).

Ecology's no further action determination is made only with respect to the release identified in the above listed reports. This no further action determination applies only the area of the property affected by the release identified in the reports listed above. It does not apply to any other release or potential release at the property, any other areas of the property, nor any other properties owned or operated by King County Department of Transportation.

Ecology will update its Leaking Underground Storage Tank database to reflect this "No Further Action" determination. Your site will not appear in future publications of the LUST database.

Ecology does not assume any liability for any release, threatened release or other conditions at the site, or for any actions taken or omitted by any person or his/her agents or employees with regard to the release, threatened release, or other conditions at the site.

The state, Ecology, and its officers and employees are immune from all liability and no cause of action of any nature may arise from any act or omission in providing this determination.

If you have any questions, please contact me at 425-649-7249.

Sincerely,

CC

Maura S. O'Brien

Toxics Cleanup Program

Gary Laakso, AGI Technologies

				App	endix D
Critical A	۹rea E۱	aluation	and	Geote	chnical
		F	Recor	nmen	dations



December 4, 2020

Mr. Matt Montagner Integrity Energy Services, Co 14405 Southeast 36th Street, Suite 210 Bellevue, Washington 98006

RE: Critical Area Evaluation and Geotechnical Recommendations
Yard Lighting Replacement for King County Metro Bellevue Base
1790 124th Avenue Northeast
Bellevue, Washington 98005
RGI Project # 2020-545-1

References: Geotechnical Engineering Report for Johnathan's Storage Facility, prepared

by Earth Consultants, Inc. dated December 23, 1977

Phase I Site Assessment Report for Metro Bellevue Base Facility, prepared

by Herrera Environmental Consultants dated November 5, 1992

Dear Mr. Montagner:

As requested, The Riley Group, Inc. (RGI) has performed a reconnaissance of the site on November 10, 2020. Our services were completed in accordance with our proposal 2020-545-PRP1 dated October 23, 2020 and authorized by Mark Foster on November 17, 2020.

PROJECT DESCRIPTION

The subject site consists of a parcel of land (King County Parcel #282505-9295) and located at 1790 124th Avenue Northeast in Bellevue, Washington. The property was developed in 1983 and is occupied by three buildings of about 28,144 square feet used for van pool operations in the northeastern and middle portion of the site, a bus yard in the western portion of the site, and an employee and visitor parking area in the eastern portion of the site.

RGI understands that King County Metro intends to improve the bus yard lighting by installing several new poles and installing new electrical conduit along the western perimeter. Based on review of City of Bellevue Critical Hazards Maps, the area to the west and south of the site is mapped as a wetland. The City of Bellevue requires a critical area report for the project permit. RGI's understanding of the project is based on a site plan prepared by Musco Lighting dated September 11, 2020.

Based on the current plan, RGI expects no major earthwork will be needed for the project.

SITE CONDITIONS

The subject property includes a parcel of land with a total area of about 8.44 acres. The site is bound to the north by a storage facility, to the east by a cement/gravel operation, and to the west and south by a wetland. The site location is shown on Figure 1.

The property is relatively level across the site with an elevation difference of less than 5 feet. Based on our observation and evaluation, the existing site seems to be raised by several feet of fill along the west portion of the site during original construction. The slope along the wetland

seems to be a fill slope. Photos 1 through 4 show the slope condition along the west property boundary.



Photo 1 Western Property Boundary – View from North



Photo 2 Western Property Boundary – View from South





Photo 3 Northern Property Boundary - View from West



Photo 4 Existing Light Pole – Along Western Property Boundary



GEOLOGY AND SOIL

Review of the *Geologic Map of the Kirkland Quadrangle, Washington* by James P. Minard (1983) indicates that the soil throughout of the site is mapped as Recessional Outwash (Map Unit Qvr) which is stratified sand and gravel with minor silt and clay deposited by meltwater streams issuing from the receding Vashon ice sheet. Based on our review of the referenced reports performed for the site and site immediately north of the site, the native soils appear to be generally similar to what was described in the geology map.

GEOLOGIC HAZARD AREAS

Regulated geologically hazardous areas include erosion, landslide, earthquake, wetland, or other geological hazards. RGI has reviewed the City of Bellevue Land Use Code (LUC) Section 20.25H.095, the area to the west of the site is a wetland. For new development close to the wetland area, a buffer/setback is generally required.

The proposed project will not be able to comply with a buffer and setback requirement. In order to be exempted from the standard buffer/setback, a critical area report will be needed.

RGI also assessed the potential for liquefaction of the site's soil during an earthquake. Review of the *Liquefaction Susceptibility Map of King County, Washington* by Stephan P. Palmer, etc., (2004) indicates the soils in the area are mapped as having a low to moderate liquefaction susceptibility during a seismic event.

SITE EVALUATION

On November 10, 2020, RGI's project geologist and principal engineer performed a reconnaissance to evaluate the site condition. We evaluated the existing poles along the western property line. We did not find any signs of previous settlement or failure. No seeps or springs were observed on the slope face through most of the property. The slope is vegetated with vines, ferns, and mixed brush, with localized small- to medium-diameter deciduous trees scattered throughout the slope.

Based on our observations, the site slopes are stable in their current configuration and condition. We didn't find any signs indicating any major failure in the past.

CONCLUSIONS

Based on our current understanding of the project, the three additional poles will be added along the western property line, one along the southern property line, one in the eastern portion of the property, and electrical conduits will be installed. The proposed earthwork is minor and will not impact the wetland. Provided the recommendations in this report are followed, the proposed construction should be exempted from the critical area requirement.

RECOMMENDATIONS

Geotechnical Considerations

Based on our study, the site is suitable for the proposed construction from a geotechnical standpoint. Detailed recommendations regarding the geotechnical design considerations are provided in the following sections. These recommendations should be incorporated into the final design drawings and construction specifications.



Erosion and Sediment Control

Potential sources or causes of erosion and sedimentation depend on construction methods, slope length and gradient, amount of soil exposed and/or disturbed, soil type, construction sequencing and weather. The impacts on erosion-prone areas can be reduced by implementing an erosion and sedimentation control plan. The plan should be designed in accordance with applicable city and/or county standards.

RGI recommends the following erosion control Best Management Practices (BMPs):

- Scheduling site preparation and grading for the drier summer and early fall months and undertaking activities that expose soil during periods of little or no rainfall
- Establishing a quarry spall construction entrance
- Installing siltation control fencing or anchored straw or coir wattles on the downhill side of work areas
- Covering soil stockpiles with anchored plastic sheeting
- > Directing runoff away from exposed soils and slopes
- ➤ Decreasing runoff velocities with check dams, straw bales or coir wattles
- Confining sediment to the project site
- Inspecting and maintaining erosion and sediment control measures frequently

Permanent erosion protection should be provided by reestablishing vegetation using hydroseeding and/or landscape planting. Until the permanent erosion protection is established, site monitoring should be performed by qualified personnel to evaluate the effectiveness of the erosion control measures. Provisions for modifications to the erosion control system based on monitoring observations should be included in the erosion and sedimentation control plan.

Structural Fill

RGI recommends the trench backfill in accordance with the following recommendations for structural fill.

The suitability of excavated site soils and import soils for compacted structural fill use will depend on the gradation and moisture content of the soil when it is placed. As the amount of fines (that portion passing the U.S. No. 200 sieve) increases, soil becomes increasingly sensitive to small changes in moisture content and adequate compaction becomes more difficult or impossible to achieve. Soils containing more than about 5 percent fines cannot be consistently compacted to a dense, non-yielding condition when the moisture content is more than 2 percent above or below optimum. Optimum moisture content is that moisture that results in the greatest compacted dry density with a specified compactive effort.

Non-organic site soils are only considered suitable for structural fill provided that their moisture content is within about two percent of the optimum moisture level as determined by American Society of Testing and Materials D1557-09 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (ASTM D1557).

Excavated site soils may be suitable for re-use as structural fill if the soil's moisture can be properly controlled. If soils are stockpiled for future reuse and wet weather is anticipated, the stockpile should be protected with plastic sheeting that is securely anchored. Even during dry weather,



moisture conditioning (such as, windrowing and drying) of site soils to be reused as structural fill may be required. Even during the summer, delays in grading can occur due to excessively high moisture conditions of the soils or due to precipitation. If wet weather occurs, the upper wetted portion of the site soils may need to be scarified and allowed to dry prior to further earthwork, or may need to be wasted from the site.

Some of the site soils are moisture sensitive and may require moisture conditioning prior to use as structural fill. If on-site soils are or become unusable, it may become necessary to import clean, granular soils to complete site work that meet the grading requirements listed in Table 1 to be used as structural fill.

Table 1 Structural Fill Gradation

U.S. Sieve Size	Percent Passing
4 inches	100
No. 4 sieve	75 percent
No. 200 sieve	5 percent *

^{*}Based on minus 3/4 inch fraction.

Prior to use, an RGI representative should observe and test all materials imported to the site for use as structural fill. Structural fill materials should be placed in uniform loose layers not exceeding 10 inches and compacted to 95 percent of the soil's maximum density as determined by ASTM D1557.

Placement and compaction of structural fill should be observed by RGI. A representative number of in-place density tests should be performed as the fill is being placed to confirm that the recommended level of compaction is achieved.

Light Pole Foundations

RGI understands that Musco Sports Lighting system will be used for the project. The pole foundation is precast concrete base that will be set directly into the ground and backfilled with concrete. RGI recommends that the diameter and depth of holes be designed by a structural engineer to make sure that it will provide enough support. RGI recommends that the pole foundation hole be drilled using a drill rig to minimize the site disturbance and amount of earthwork. The minimum diameter and depth of the foundation should be 2 feet and 8 feet, respectively.

The pole foundations should be designed by a structural engineer based on the size of the pole and loading conditions. The soil parameters in Table 2 and Figure 3 should be used for the foundation design.



Table 2 Foundation Design

Design Parameter	Value
Allowable Bearing Capacity – Native soil	2,000 psf ¹
Passive pressure (equivalent fluid pressure)	200 pcf ²
Side friction	750 psf ¹
Minimum foundation diameter	2 feet
Minimum foundation depth	8 feet

^{1.} psf = pounds per square foot

The allowable foundation bearing pressures apply to dead loads plus design live load conditions. For short-term loads, such as wind and seismic, a 1/3 increase in this allowable capacity may be used. RGI recommends not including the upper 2 feet of soil in the computation of passive pressures and side friction because they can be affected by weather or disturbed by future grading activity. The passive pressure value assumes the foundation will be constructed neat against competent soil and includes a safety factor of about 1.5.

With the drilled pier foundations designed in accordance with the recommendations in this section, maximum total post-construction settlement of less than one inch should be expected.

Utilities

Based on current plan, electrical conduits will be installed between the fence and curb along the western property line. RGI believes that the electrical conduits can be installed at any convenient location without any concern.

Utility pipes should be bedded and backfilled in accordance with American Public Works Association (APWA) specifications. For site utilities located within the right-of-ways, bedding and backfill should be completed in accordance with City of Bellevue specifications. At a minimum, trench backfill should be placed and compacted as structural fill. Where utilities occur below unimproved areas, the degree of compaction can be reduced to a minimum of 90 percent of the soil's maximum density as determined by the referenced ASTM D1557. As noted, soils excavated on site may not be suitable for use as backfill material. Imported structural fill meeting the gradation provided in Table 1 may need to be imported for use as trench backfill.

LIMITATIONS

This letter is the property of RGI, Integrity Energy, Co, and their designated agents. Within the limits of the scope and budget, this letter was prepared in accordance with generally accepted geotechnical engineering practices in the area at the time this letter was issued. The report is an evaluation of the site based on available information. No geotechnical exploration was performed in this scope of work. The report can only be used in project planning and preliminary design. No other warranty, expressed or implied, is made. Site safety, excavation support, and dewatering requirements are the responsibility of others.



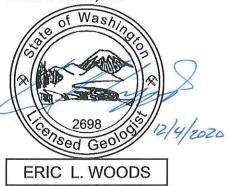
². pcf = pounds per cubic foot

The analyses and recommendations presented in this letter are based upon visual observation of the slope, no explorations or slope stability analysis was completed in preparation of this letter. Variations in soil and groundwater conditions can occur over time.

Please call us at (425) 415-0551 if you have any questions or need additional information.

Respectfully submitted,

THE RILEY GROUP, INC.



Eric L. Woods, LG Project Geologist RUNQI WASHINGTON 35013

35013

35013

35013

12/4/2020

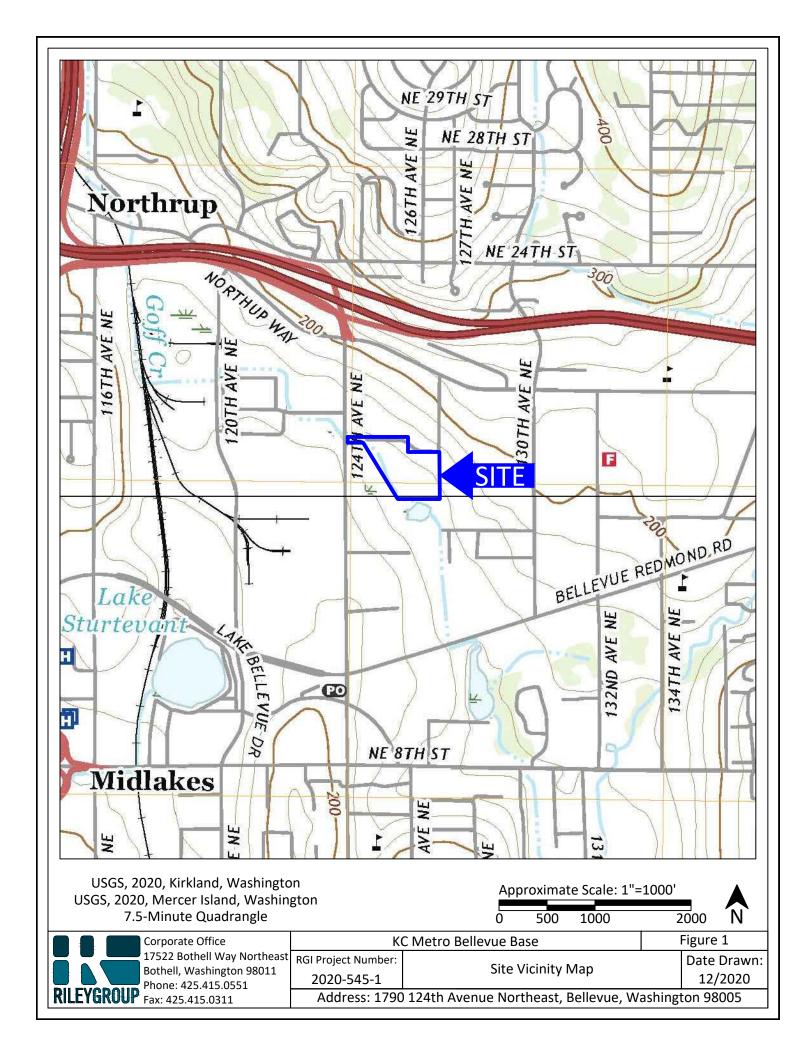
Ricky R. Wang, PhD, PE Principal Engineer

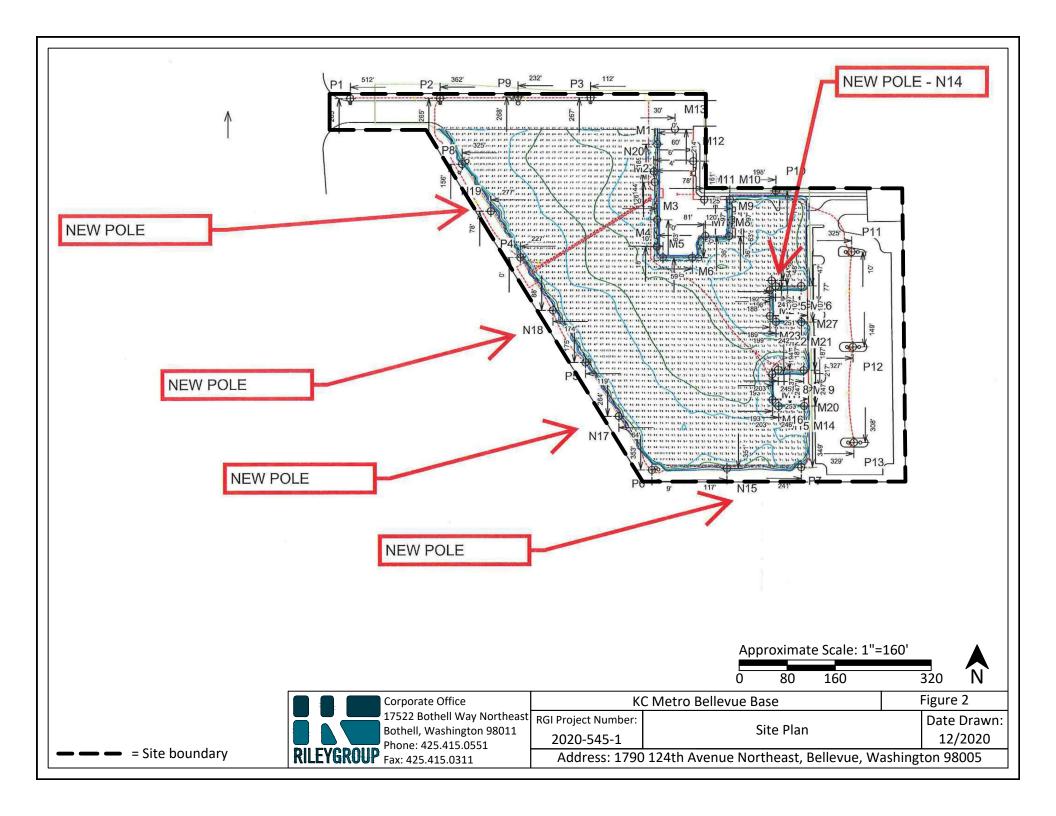
Attachments:

Figure 1 Vicinity Map Figure 2 Site Plan

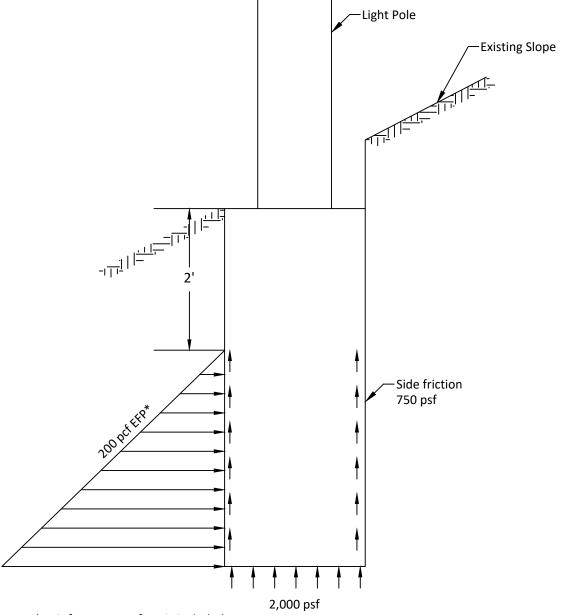
Figure 3 Light Pole Foundation Design







DESIGN PARAMETERS FOR LIGHT POLE FOUNDATION



* A Safety Factor of 1.5 is included

Not to Scale

Corporate Office	K	Figure 3						
17522 Bothell Way Northeast Bothell, Washington 98011 Phone: 425,415,0551	RGI Project Number: 2020-545-1	Light Pole Foundation Design	Date Drawn: 12/2020					
RILEYGROUP Fax: 425.415.0311	Address: 1790 124th Avenue Northeast, Bellevue, Washington 98005							

	Appendix E
West Tributary	/ Habitat Assessment

West Tributary Habitat Assessment Final Report

September 2016

Submitted to:
The City of Bellevue
450 110th Avenue, NE
Bellevue, WA 98009

Submitted by: Tetra Tech, Inc.



1420 Fifth Avenue, Suite 550 Seattle, WA 98101



MEMO

To:	Jerry Shuster, Kit Paulsen, City of Bellevue
Cc:	Ralph Nelson, Louis Berger Group
From:	Merri Martz, Sara Townsend, Greg Woloveke, Tetra Tech, Inc.
Date:	September 2016
Subject:	West Tributary Habitat Assessment Final Technical Report

1.0 INTRODUCTION

The City of Bellevue (City) is implementing its strategic initiative of stream assessment, as characterized in the approved *Storm and Surface Water System Plan* (City 2016). Baseline habitat conditions within the City's streams have not been assessed for many years. The baseline conditions are necessary to prioritize streams for restoration. The first step in this process is to develop a standardized protocol for rapid habitat assessment and mapping of other important features in the stream corridors.

This study has two primary purposes; (1) to create a protocol for rapid habitat assessment that the City may use to characterize each of their streams, and (2) use the protocol to collect baseline data for the West Tributary and report the existing habitat conditions.

The City contracted with Louis Berger Group and Tetra Tech, Inc. (subconsultant) to develop a standardized assessment protocol and data collection system that could be easily imported into the City's GIS database. The City specified that this system would be based upon the Washington Department of Fish and Wildlife's *Fish Passage and Surface Water Diversion Screening Assessment and Prioritization Manual* (WDFW 2009). The City also requested collection of data beyond that required by the WDFW protocol as part of the baseline assessment. Additional data collection was requested by the City to include potential water pollution concerns, low-flow conditions and potential fish passage barriers, presence and function of large wood, armoring and erosion sites, Wolman pebble counts, and identifying and prioritizing actions to restore stream health.

This protocol was implemented and tested on the West Tributary, a tributary to Kelsey Creek, in 2016. This final technical report summarizes the assessment protocol, data collection methods, results of its application to the West Tributary, recommendations for future stream assessments within the City, and identifies and prioritizes opportunities within the West Tributary system to improve habitat conditions and fish passage, and more effectively manage stormwater runoff and sediment movement.

2.0 METHODS

The basis for the habitat assessment protocol is described in Chapter 9 of the *Fish Passage and Surface Water Diversion Screening Assessment and Prioritization Manual* (WDFW 2009). The WDFW protocol was developed to assist the state in identifying and prioritizing fish passage and screening needs for the conservation of native fish species. These needs are prioritized based on the amount, quality, and potential fish use of habitats upstream of fish passage barriers.

The field assessment was planned based on 10 pre-delineated stream reaches, from downstream to upstream (Streams Segments: 76_04, 80_01, 80_02, 80_03, 80_03-Trib, 80_04, 80_05, 80_06, 80_07, 80_08). The City delineated the West Tributary into geomorphic reaches in 2001 using methods developed by the Washington Department of Natural Resources (WDNR). Reach breaks were located at major road crossings, where there were clear geomorphic changes, where stream characteristics change sufficiently to affect the potential for fish use and productivity, or where there were human-caused fish passage barriers. During the field assessment, predelineated reach breaks were ground-truthed. Recommendations for revisions to reach breaks are provided in the results section below.

The WDFW protocol requires that, for streams longer than 1 mile, a 60-meter sampling segment be inventoried for every 320 meters of stream, as long as it is considered to be representative of that 320-meter length. The first 60 meters of each 320-meter length was assessed for this study, unless that 60 meter segment was not considered representative or was not accessible. Reaches and reach segments are shown in Figure 1. Where reaches were longer than 320 meters, additional 60-meter reach segments were evaluated. For example, reach 80_01 was a total of 1,430 meters, resulting in three sets of data (80_01-1, 80_01-2, and 80_01-3). Goff Creek is a tributary to the West Tributary, but was not assessed for this study.

2.1 WDFW PROTOCOL

Based on the WDFW protocol, several habitat conditions were inventoried within each reach segment (additional data collected based on the City's request is described in Section 2.2). Characteristics that were inventoried are described below. In some cases, slight modifications were made to the WDFW protocol and are noted below.

Habitat Units. Beginning at the downstream end of each 60-meter segment, each habitat unit was measured with a measuring tape. Under the WDFW protocol these habitat units could be classified as pools, riffles, ponds, or rapids. Glides are characterized as either pools or riffles depending on depth and are not distinguished separately under the WDFW protocol. For the purposes of this project, glides were included as distinct habitat units and defined as areas that were too deep to be considered riffles, had no surface turbulence, and were too fast moving to be pools. The habitat units identified for this study included:

- Pools relatively deep, low velocity water and smooth water surface.
- Riffles rapid and shallow water flow with surface turbulence.
- Rapids high gradient riffles with larger substrate and white water.
- Ponds zero gradient with average width at least five times that of the average pool width and length.
- Glides relatively fast water, deeper than riffles, with smooth water surface.

Each habitat unit was measured for wetted width, scour line width and average water depth at a representative cross section.

Substrate Composition. The river bed substrate was visually estimated, resulting in an estimated percent of each substrate type, including boulder, cobble, gravel, and sand or fines. Potential spawning habitat was defined for this assessment as areas of coarse substrate (i.e. gravel and/or cobbles) that had less than 26% fines, as visually estimated.

Gradient. The slope of the stream was measured via clinometer or using a stadia rod. In areas where gradient could not be assessed due to overgrown vegetation, gradients were determined using topographic maps.

Temperature. Celsius temperature of each habitat unit within each 60-meter segment was measured via thermometer.

Spawning and Rearing Habitat Quality. The quality of spawning or rearing habitat was evaluated at each habitat unit. These were qualitatively defined with a score of 0 (none), 0.33 (poor), 0.67 (fair), or 1 (good).

Spring Influence. Water volume may vary depending on the influence of springs or groundwater. The likelihood of spring influence was determined based on differences between wetted width and scour line width and channel morphology. Spring influence was scored as 0 (absent), 1 (slight), 2 (moderate), 3 (pronounced).

Canopy Composition. Each habitat unit was visually estimated for total percent canopy cover, assuming fully leafed out canopy conditions.

Instream Cover. Each habitat unit was visually estimated for the presence of instream cover elements such as large wood, undercut banks, boulders, or close overhanging vegetation. These were qualitatively defined with a value of low, medium, or high.

Juvenile Fish. Under the WDFW protocol, juvenile fish observed are to be identified, if possible, and counted. For this study we identified and counted juvenile and adult fish.

Total Culvert Length. Piped sections, or portions of the stream that flowed through culverts, were field verified and included in GIS mapping. Total culvert lengths were estimated using City mapping and aerial photography. In addition, outfalls or other pipe crossings were mapped. All outfalls identified in the field were observed to determine if any illicit discharges were occurring in order to notify the City.

2.2 ADDITIONAL DATA COLLECTION

Beyond the WDFW protocol, the following parameters were assessed at the request of the City for all habitat units in each 60-meter reach segment:

Wolman Pebble Counts. Pebble counts provide data to describe embeddedness and substrate composition within potential spawning habitat and to support hydraulic modeling.

Riparian Species Cover. In addition to the WDFW protocol to identify the percent canopy cover, the City requested the identification of percent shrub and herbaceous cover, and the dominant species that comprised each layer.

Non-Native Species Cover. The total percent cover of non-native species was visually estimated for each habitat unit.

The City also identified parameters to assess for the entire length of the stream; these parameters were not limited to the 60 meter reach segments, but were described for the entire reach, where streams were accessible.

Large Wood. The abundance, size, location, habitat forming function, and potential for causing a flood risk were evaluated for each reach.

Fish Passage Barriers. Any feature that would potentially block upstream fish passage was noted, its location marked on a map, and described. A blockage was considered a barrier if it created a drop of greater than six inches.

Low Flow Conditions. Reaches of stream with depths of less than 12 inches were noted and locations described.

Two datasheets were created for this assessment to be used easily with either tablet-based or hardcopy field data collection (Appendix A). One data sheet was used for each 60-meter reach segment, and included all the relevant elements from the WDFW protocol, as well as those that were modified by the City. The other data sheet was used to collect the additional non-WDFW protocol data of interest to the City.

All features were mapped using the PDF Maps application on the tablet and also using a Trimble GeoXH GPS to compare the relative accuracy between the two methods. In addition, numerous georeferenced photos were taken for each reach to document key features and general conditions.

This assessment did not include a summer illicit discharge investigation, but all outfalls observed were documented and identified as to whether anything other than groundwater or irrigation water appeared to be flowing from the outfall.

2.3 DATA MANAGEMENT

Data was collected under this protocol using an iPad tablet and handheld Trimble GPS unit. The same data can be collected on any model of tablet that supports the use of PDF documents (such as PDF Expert) and geotagged mapping (such as PDF Maps). Data sheets were produced prior to field work using Nuance Power PDF, but could also be built using Adobe or any other fillable form application. Also prior to field work, the tablet was outfitted with PDF Maps, PDF Expert, and Dropbox applications.

During field data collection, the multiple utility of the tablet allows for data sheet completion, photo collection, and GPS placemarking all within the same tool. Our tablet was also be outfitted with a case that is water and impact resistant, helpful for work in streams and wetlands. Fillable PDF data sheets were opened on the tablet using PDF Expert, a fillable form management application. The fillable forms can be directly completed in the field. Once the forms are completed, they are automatically saved within the PDF Expert application. To create a new data sheet, a copy is created and then renamed. Any number of field data forms can be stored on the tablet, with a file organization system similar to most desktop computers.

Although we collected data with a handheld Trimble GPS unit, we also used the tablet to monitor our location. Using PDF Maps, we were able to upload georeferenced project maps to the tablet, which would monitor the team's position. This allowed the team to see where they were in relation to GIS maps of the project, complete with project features, utilities, roadways, and other features of note. It was also used to create a placemark at a location of interest while conducting field work. For example, outfalls and pedestrian bridges that were not previously mapped were marked on the GIS project maps with a single tap on the tablet screen. Although the tablet GPS system is not as accurate as a Trimble unit, we found that we were able to locate placemarks accurately when the project maps were available to assist in determining locations. For example, property lines, roads, utilities or other reference points were used to accurately locate placemarks.

Once field data was gathered for the day, the tablet was wirelessly synced to a Dropbox account. This allowed wireless transfer of all data sheets to server storage provided by Dropbox. If the tablet has a mobile data account, data sheets may also be uploaded while in the field. Similarly, photos and placemark files can be exported to Dropbox at any time.

Once data is uploaded, fillable PDF forms can be exported to Excel for ease of data management and analysis. We found that Adobe Pro DC provided an export utility that created the most accurate replica of the PDF data sheet in Excel.

The next steps were to create KMLs (Keyhole Markup Language) that could be imported into Google Earth or any other GIS system, which would display the location of the geotagged photos and placemarks collected in the field. Photos were uploaded onto Picasa (a Google application), which allows geotagged photos to be uploaded directly into Google Earth from a Picasa web album for initial viewing. The KMLs can be imported to GIS as points that can be clicked on when viewing the GIS maps.

Below are the links to the applications that were used for data collection.

Nuance PDF. Created fillable forms.

Adobe Pro DC. Exported completed data to Excel spreadsheets. Would be more seamless to create forms in Adobe Pro and export with same software package.

<u>PDF Expert.</u> Fillable form management system on tablet, provides autosave and ability to wirelessly upload to server storage.

<u>PDF Maps.</u> Application that allows user to follow their location within predesigned project maps and to create placemarks within those maps to mark features of interest. The accuracy is approximately 10-15 feet, which is less accurate than a Trimble or similar GPS unit (< 3 feet). However, Trimble satellite coverage was often compromised by heavy tree canopy, making many points difficult to collect.

<u>Google Earth.</u> This application allows KML files to be imported, showing geotagged photos and placemarks on top of Google Earth aerial photography for quick scanning.

<u>Picasa.</u> Connected to Google, this application allows uploaded geotagged photos to be imported directly into Google Earth.

Dropbox. Server or "cloud" storage site, where data sheets were wirelessly transferred after each field day.

3.0 HABITAT ASSESSMENT RESULTS

3.1 WATER TYPING

The City provided GIS mapping that included water typing, based on City data and fish sampling conducted in 2001 and reported in the *City of Bellevue Stream Typing Inventory* (City 2009). Reaches 76_04 through 80-04 were designated as Type F (fish bearing) based on known fish presence and use, Reaches 80_05 and 80_06 and the unnamed tributary (Reach 80_03_01) were designated as Type NP (perennial non-fish bearing), and Reaches 80_07 and 80_08 were designated as Type NS (seasonal non-fish bearing). These designation were reviewed to determine if changes should be made.

The WDFW protocol indicates that to determine fish use, several methods can be used to identify if the stream has the potential to provide fish habitat. Meeting one or more of the criteria (in italics) qualifies the stream as fish bearing or potential fish habitat:

- Watercourses having scour line widths greater than 2 feet (0.6 meters) in western Washington, if the
 gradient is less than 20 percent. The West Tributary and the unnamed tributary both meet this criterion for
 their entire length.
- Streams identified as fish bearing by the Washington Department of Natural Resources (DNR) Water
 Typing Project (as shown on the <u>Forest Practices Application Mapping Tool</u>). The West Tributary is
 mapped as Type F (fish bearing) for its entire length. The unnamed tributary is not mapped.
- Watercourses with documented salmonid use determined by visual observation, electrofishing, or verification by local biologists. Juvenile salmonids were observed in Reaches 76_04 up through 80_04 in this assessment and had been documented by electrofishing in 2001 (City 2009).
- Watercourses listed as fish bearing on the SalmonScape website. Chinook, coho, and sockeye salmon have all been documented in Reaches 76-04 up through 80_04 to the Goff Creek confluence and all species are modeled to be present for the entire length. The unnamed tributary is not mapped.

The DNR Water Type Classification Worksheets were completed for the West Tributary and the unnamed tributary and are included in Appendix A. Based on the above criteria and the water type classification worksheet, the West Tributary should be classified as a Type F (fish bearing) stream for its entire length. The unnamed

tributary should be classified as a Type F based on the condition in June 2016, where it met the 2-foot bankfull width criterion. This stream should also be viewed in later summer to determine if it truly is perennial, or if it only has seasonal flow.

3.2 SUMMARY OF OVERALL STREAM CONDITIONS

The West Tributary is approximately 3.2 miles in length with one major tributary, Goff Creek that enters at river mile (RM) 2.0, and one unnamed small tributary that enters from the west at approximately RM 1.9; this small tributary is approximately 0.3 mile in length. Goff Creek was not assessed in this study, but will be assessed in a later separate study. The total length of the West Tributary that runs through culverts or pipes is approximately 2,560 feet (0.48 mile) or 16% of the total length. For the unnamed tributary, approximately 360 feet is conveyed in culverts or pipes, approximately 22% of its length. In general, the stream varies from a system with beaver ponds where no clear stream channel is visible, to a typical small order stream with interspersed pools and riffles, to large marsh-dominated areas with no defined stream channel. The most commonly encountered habitat type was glide, followed by pool and then riffle.

Overall, the results of this habitat assessment indicate that the West Tributary has very limited spawning habitat available and areas with suitably sized spawning gravels have substantial amounts of fine sediment that could limit survival of eggs if spawning occurs. Potential spawning habitat is generally only present downstream of NE 8th Street. Rearing habitat is available in most reaches, although during low flow conditions, water depths are quite shallow and there is a lack of cover in most reaches. Areas with beaver activity have the best quality rearing habitat in ponds and wetlands. Lengthy culverts likely prevent fish access above NE Bellevue-Redmond Road and 120th Avenue NE. Stormwater detention gates upstream of NE 8th Street also may hinder fish passage. No illicit discharges were observed. Riparian vegetation and shading conditions were highly variable in quality and non-native invasive species are present and dominant in most reaches. Large wood is limited in most reaches, but present in moderate quantities in areas of beaver activity. Water temperatures were high during the assessment and rose predictably throughout each day similar to air temperatures.

Spawning and rearing fish habitat quality were most often recorded as poor, with rearing habitat comprising a much larger proportion of habitat than spawning habitat. Rearing habitat was limited (degraded) most often by insufficient water depth, invasive vegetation that may prevent passage, and a lack of instream habitat cover such as wood, undercut banks and shade. The most influential factor in creating rearing habitat was beaver activity, which created backwater refugia and complex wetlands with relatively large amounts of wood. Spawning habitat of good quality was not observed, although patches of poor quality (0.33 score) were more common and a few fair (0.67 score) quality spawning areas were observed. Spawning habitat quality was limited by the high percentage of fines and embeddedness in riffles, as well as insufficient water depths and a lack of cover.

Several potential fish passage barriers were present, including weirs and rock or debris accumulations, but these may only be barriers during low flow conditions. Generally low flow conditions were prevalent at the time of the field investigations. Several beaver dams were present, but were not considered to be fish passage barriers. Only one culvert with a drop at its outlet was observed at the very upstream end (Reach 80_08), all others that were observable were backwatered or without drops. The primary issue with passability at culverts is the very long lengths that are piped at NE Bellevue-Redmond Road and 120th Avenue NE.

Water temperatures ranged from 59.1°F (15.1°C) to 67.8°F (19.9°C), with higher temperatures recorded where streamflow was lower or in correlation with air temperature (i.e. water temperatures increased from morning to afternoon on each day of sampling). Temperatures above a 7-day maximum of 63.5°F (17.5°C) exceed Washington State Water Quality Standards for salmonid spawning, rearing and migration habitat (WAC 173-201A-200). While only spot checks of temperature were conducted in this assessment, it is highly likely that even higher 7-day maximum temperatures would be recorded later in summer (i.e. August) when flows are likely to be lower and air temperatures higher.

Water depths typically varied from a few inches to about 2 feet in most sections of stream channel; however, where beaver ponds were present, depths could exceed 5 feet. It is estimated that over 50% of the length of the West Tributary was flowing at depths less than 12 inches at the time of the field assessment and in areas that could be observed. In addition, much of this shallow 50% is only 6 inches deep or less. It is likely that depths would be even lower in later summer. The unnamed tributary may only have seasonal flow if investigated later in the summer during the lowest flows. Depths were typically only 2-3 inches at the time of the field assessment.

Wetted widths and scour width varied from 3 feet (0.9 m) to 130 feet (40 m) on the West Tributary, though only two widths were greater than 15 feet and were found where ponds were present. Wetted width on the unnamed tributary varied from 0.65 feet (0.2 m) to 4.9 feet (1.5 m) and scour width varied from 2.3 feet (0.7 m) to 5.9 feet (1.8 m). As defined in the WDFW protocol, spring influence appears to range from moderate (wetted width at least 2/3 of scour line width) to pronounced (i.e. wetted width essentially equaled the scour line width). A large portion of the stream has essentially the same wetted and scour line widths. Evidence of scour is limited in more confined reaches because armoring is present in most locations; evidence of scour is limited in unconfined reaches due to the presence of beaver ponds or larger wetland complexes. In more confined reaches, it appears that the water level increases vertically up an armored bank during storm flows, but does not show evidence of recent bank scour. The channel has likely incised in the past (when first developed) and riprap is present in the bed in many areas where it may have scoured off the banks in past events, but now this riprap is stabilizing the channel bed, along with installed weirs and armored substrate (i.e. cobbles). The presence of stormwater detention basins and beaver dams in the upper reaches of the stream may also reduce further channel incision.

Areas of erosion were most pronounced within the Glendale Country Club Golf Course (Reach 80_01), where the combination of a high groundwater table and stream forces on banks with limited vegetation have likely both contributed to bank slumps. No other substantial areas of erosion were observed. Armoring was abundant, particularly on private property in residential areas (Reaches 80_02 and 80_03).

Flood risk locations were observed at two sites; the NE 1st Street culvert on the West Tributary and the 126th Avenue NE culvert on the unnamed tributary that has partially collapsed. Both of these culverts are owned by the City of Bellevue. The box culvert at NE 1st Street is as wide as the channel width, but of very low clearance (<2 feet) due to extensive sediment deposition in the culvert. Small debris piles have also accumulated in the culvert. The property owners at this location indicated that large wood has blocked the culvert in the past and that they have reported this condition to the City previously.

Numerous outfalls and pipe crossings were observed and are shown in the reach figures (Figures 2-12). Although many of the outfalls conveyed water into the stream, no illicit discharges were observed. It is likely that most of the outfalls are from slope or curtain drains and convey groundwater. Some likely also convey irrigation runoff, such as in the golf course.

3.3 REACH DESCRIPTIONS

This section provides a review of the data collected by habitat unit (HU) for each reach segment, as well as for the entire reach. Table 1 provides a summary of the data for each reach segment surveyed. Narrative descriptions for each reach are in the following paragraphs. Figures 2 through 12 show the reaches, surveyed reach segments, and major features identified. GIS layers and photos have been provided electronically. In general, reaches were surveyed from the downstream end moving upstream. Data sheets are provided in Appendix A.

3.3.1 Reach 76 04

Reach surveys began in the downstream-most portion of the West Tributary, upstream of its confluence with Kelsey Creek. The majority of this reach can be characterized as a beaver pond complex. Dense vegetation growth and deep water prevented accessing all the way downstream to Kelsey Creek (normally, the downstream 200 feet [60 m] of a reach would be surveyed). Instead, the surveyed segment began approximately 330 feet (100

m) downstream of the upstream end of the reach. There was one reach segment surveyed (76_04-1), which included two habitat units, one pond and one glide. The glide area was only recently returned to a channel from a breached beaver dam. Wetted width and scour widths were the same at 11.8 feet (3.6 m). The average depth was 2 feet (0.6 m).

Vegetation was dominated by willow species (*Salix lasiandra, Salix sitchensis*), classified primarily as shrub cover. Non-native blackberries (*Rubus armeniacus*) were also present and reed canary grass (*Phalaris arundinacea*) was dominant in the understory. Herbaceous cover was generally about 75%. There was limited tree canopy cover (10-25%), although numerous standing snags were present (i.e. had been drowned by beaver activity).

This reach had low to medium instream cover that included large wood (an estimated 50 pieces, approximately half of those were submerged in deep water but encountered when walking) and overhanging vegetation. Substrate was 95 to 100% fines, thus no potential spawning habitat was present, and no Wolman pebble count was conducted. Beaver ponds and wetlands provide high quality rearing habitat for juvenile salmonids, lamprey, and other native fish species if cold water and good cover are present. Beaver ponds and wetlands also provide good winter refugia from high flows. Gradient was measured at 0%.

There were no fish passage barriers observed in this reach, nor was there armoring, areas of erosion, outfalls, or areas where the stream enters a culvert. Rearing habitat was available in this reach, but is limited by high water temperature (17.7°C), little habitat complexity, high organic materials in the substrate, and low to moderate instream cover. One juvenile cutthroat trout was observed in this reach. Tannic or turbid conditions prevented observation of any other fish.

3.3.2 Reach 80 01

Reach 80_01 begins at the southernmost pedestrian bridge in Kelsey Creek Farm Park. The stream runs through the park and then transitions into the Glendale Country Club Golf Course. This entire reach was walked and observed. Vegetation conditions are substantially different between Kelsey Creek Farm Park and the golf course and could be considered for revising into two separate reaches. However, because the geomorphic conditions are not substantially different, we do not recommend revising this reach, except at the upstream end, as identified in Section 5.3.

Reach 80_01 is quite lengthy, approximately 4,690 feet (1,430 m) and thus three segments were surveyed (80_01-1, 80_01-2, and 80_01-3). The Kelsey Creek Farm Park portion is a low complexity system, dominated by shallow riffles and short glides. Few pools are present and of limited depth. Two segments were surveyed within the park documenting three glides and two riffles. Wetted widths and scour widths were essentially the same at each habitat unit measured in the park, ranging from 7.5 feet (2.3 m) to 10.7 feet (3.3 m). Average depths in glides were 1.4 feet (0.4 m) and in riffles were 0.7 feet (0.2 m). At higher flows than observed, two side channels or backwaters are present, but were dry during the field assessment. Substrate was dominated fairly coequally by small gravel, cobbles and fines.

The most common trees within the park included red alder (*Alnus rubra*) and willows (*Salix* sp.). The City has done extensive riparian plantings in the park that are up to 20 years old and now provide good shading in the majority of the park. Other species include red-osier dogwood (*Cornus stolonifera*), Douglas' spirea (*Spirea douglasii*), Sitka spruce (*Picea sitchensis*), ninebark (*Physocarpus capitatus*), salmonberry (*Rubus spectabilis*), and jewelweed (*Impatiens noli-tangere*). At the upper end of the park, near the property boundary, the understory is dominated by blackberry.

Two riffles with potential spawning area were observed within the farm property. A Wolman pebble count was conducted that confirmed that fines in this area were 23%, resulting in a spawning HQM score of 0.33 (poor). The second segment surveyed within the park had been stabilized with the installation of large wood along the right bank. The wood served as bank protection, along with ballasting rock. This keeps the channel from meandering

into the more developed area of the park and provides a small amount of stream cover. Several juvenile cutthroat trout were observed within the park.

Three bridge crossing are present in the park and one spanning log that forms a small weir (< 6 inches). These are not likely to be fish passage barriers. The majority of the wood in the overall reach is located within the park, but is not generally influencing stream habitat, other than providing a limited amount of cover (larger logs installed along the bankline or larger logs spanning over the channel). A total of 37 pieces of wood were identified in this reach.

Within the golf course, the stream channel becomes narrower and more incised, with only glide or riffle habitat units present. In the surveyed segment within the golf course, only one habitat unit was measured, a 200-foot (60 m) riffle. Wetted width was 7.4 feet (2.3 m) and scour line width was 11 feet (3.4 m). Average depth was 0.4 feet (0.1 m). Substrate was dominated by small gravel, but with significant components of fines.

The most common tree along the stream in the golf course was Douglas fir (*Pseudotsuga menziesi*). Reed canary grass and other mowed grasses were dominant in the understory. The reach was classified by the City to end at the upstream-most pedestrian bridge, approximately 230 feet downstream of the property boundary. The creek begins to transition to higher banks and a more confined nature at this location, but as the confinement and management dramatically changes as the creek enters the upstream residential properties, we recommend extending Reach 80_01 to end at the upstream golf course property boundary. In this last section of the golf course, the vegetation had formerly been entirely blackberries, and had recently been mowed. The most significant degradation of habitat through the golf course is the lack of a riparian zone. The sparse Douglas firs lining a portion of the stream provide substantial shading that is lacking in nearly 2/3 of the golf course. The golf course maintains an unmowed buffer along the creek, but as it is dominated by reed canary grass, it is of limited value.

A Wolman pebble count was conducted in Reach 80_01 and indicated that fines were around 21%, which results in a spawning HQM score of 0.67 (fair). However, much of this reach was flowing at less than 6 inches deep. Other limitations to spawning habitat quality included the lack of instream cover and low instream complexity. Rearing habitat quality is poor (HQM score of 0.33) through this reach from lack of instream cover, low instream complexity, and high water temperatures (17.3°C). Numerous areas of armoring and erosion were present throughout the golf course, with significant stretches of bank slumping and riprap. This reach was the only reach on the entire stream with significant erosion occurring. There were four pedestrian bridges, but no culverts. These are not likely to be fish passage barriers. Numerous outfalls are present throughout the golf course that appear to drain groundwater and/or irrigation water and two pipe crossings (overhead) are present. Gradient was estimated as less than 1% (compared to 0.5% by City GIS).

3.3.3 Reach 80_02

This reach begins at the northern end of the Glendale Country Club Golf Course and stretches through residential areas to NE 3rd Street. The majority of this reach was walked and visually observed, excluding approximately 30% was not accessible due to unwilling landowners. As described above and in Section 5.3, we recommend moving the start of this reach to begin at the golf course property boundary. This reach becomes more confined into a ravine with bank heights at least 6 feet above the creek bed, and becoming higher approaching NE 3rd Street (approximately 15 feet high). Moving the reach break would shorten this reach by approximately 230 feet, from its current length of 1,374 feet.

Two segments were surveyed in this reach, including one that began in the golf course (80_02-1) and one just downstream of NE 3rd Street (80_02-2). The habitat units surveyed in this reach included pools, riffles, and glides, although the riffles accounted for the vast majority of the surveyed segments. Wetted widths ranged from 6 feet (1.8 m) to 9 feet (2.7 m) and scour line widths ranged from 7.5 feet (2.3 m) to 11.5 feet (3.5 m). Average depths in pools were 1.1 feet (0.33 m) and in riffles were 0.5 feet (0.15 m). Substrate was generally coequally dominated by gravels and fines, but cobbles were also present. At the upstream end of the reach, boulders (i.e. riprap) had

fallen into the creek in many locations. Large wood was generally sparse in this reach, with approximately 25 pieces identified (generally small pieces), and it does not provide habitat.

The riparian vegetation was dominated by ornamentals through private yards, although red alder, Western red cedar (*Thuja plicata*), big-leaf maple (*Acer macrophyllum*) and cottonwood (*Populus balsamifera*) were also dominant tree species. Other species included lady fern (*Athyrium filix-femina*), small-fruited bulrush (*Scirpus microcarpus*), and heavy dominance of blackberry and bamboo. For the most part, there is tree canopy cover and substantial shading through this reach. While ornamental vegetation is not high quality habitat, it does maintain shading and this may be the primary condition to maintain in this reach.

The vast majority of this reach is armored on both banks. We estimated that 90% of the reach is armored and did not identify individual armoring segments after the first properties. Armoring includes riprap, gabions, concrete blocks and a variety of debris. As a result of the extensive armoring, signs of erosion were not observed. This reach includes two culvert crossings (NE 1st Street and NE 3rd Street), one pedestrian bridge, and at least two fence crossings with low clearance. Of immediate flood concern is the sediment deposition in the NE 1st Street culvert. This culvert provides only 1.6 feet of clearance and appears to be accumulating debris. The adjacent landowner indicated that logs had been jammed in this culvert in the past (now removed) and they have notified the City of their concerns.

A Wolman pebble count was conducted in Reach 80_02 and indicated that fines were 16% or less, which is quite different from the visual observations of 20 to 30% fines. This is an overall difference noted between the WDFW protocol and the Wolman pebble count because the pebble counts can be skewed by the presence of larger cobbles and boulders that cover up fines (resulting in fewer fines being selected). The spawning HQM score was 0.33 (poor) from the high level of fines and the rearing HQM score was also 0.33 (poor). Other limitations to both spawning and rearing habitat quality included the lack of instream cover and low instream complexity. High water temperatures (up to 18.8°C) further reduce the quality of rearing habitat. A juvenile cutthroat trout and a larger juvenile or small adult cutthroat trout were observed in this reach.

Four drops greater than 12 inches were observed over weirs (2 upstream of 3rd Street and 2 downstream of 3rd Street) in the upstream 130 feet (40 m) of this reach. The culvert at NE 1st Street is likely to cause a velocity barrier to fish at higher flows due to its limited capacity. The culvert at NE 3rd Street does not appear to be a fish passage barrier as there is no drop at the outlet, the culvert is countersunk and the width is at least 75% of the average channel width. Gradient was estimated at 2% (as compared to 2.2% in City GIS).

3.3.4 Reach 80 03

Reach 80_03 begins approximately 65 feet (20 m) upstream of NE 3rd Street and continues upstream for approximately 2,450 feet (740 m) to the confluence with the unnamed tributary, joining from the right bank (west). Approximately 2/3 of this reach was walked and observed, but the middle portion was not accessible due to unwilling landowners. Two reach segments were surveyed (80_03-1, 80_03-2).

This reach is less confined with lower banks, approximately 3-4 feet typically, than Reach 80_02. This reach is also predominantly residential, so is similarly armored and manipulated for private yards in the majority of the reach. Two segments were surveyed in this reach and the habitat units surveyed included riffles and glides, with riffles occupying the majority of the length surveyed. Wetted widths ranged from 7.5 feet (2.3 m) to 11.2 feet (3.4 m) and scour line widths ranged from 7.5 feet (2.3 m) to 12.5 feet (3.8 m). Average depths in glides were 0.65 feet (0.2 m), and in riffles were 0.3 feet (0.1 m). Substrate was dominated by gravel, although fines ranged from 20-35% and cobbles were present. A few boulders were also present that had generally been placed or fell into the stream from adjacent banks. Large wood is very sparse in this reach, with only 6 pieces identified of medium size that are not contributing to habitat function.

The riparian vegetation was dominated by native trees, including red alder, cottonwood, Douglas fir, and big-leaf maple, but the understory was dominated by invasives such as ivy (*Hedera helix*), blackberry, and reed canary

grass, and ornamentals such as rhododendrons, with some natives such as lady fern. Some native shrubs such as willow and ninebark were also present. This reach also had generally good tree canopy cover and shading.

The vast majority of this reach is armored on both banks. We estimated that 80% of the reach is armored and did not identify individual armoring segments. Armoring includes riprap, gabions, concrete blocks and a variety of debris. As a result of the extensive armoring, signs of erosion were not observed. This reach includes two culvert crossings (NE 8th Street and a roadway to a gate structure) and at least six pedestrian bridges. Both banks are armored between NE 8th Street and the roadway with gate structure.

A Wolman pebble count was conducted in Reach 80_03 and indicated that fines were 12-18%, which is also different from the visual observations of 20% fines. This is an overall difference noted between the WDFW protocol and the Wolman pebble count because the pebble counts can be skewed by the presence of larger cobbles and boulders that cover up fines (so they are not selected). The spawning HQM scores were 0.33 (poor) with one score of 0.67 (fair) in the area of 12% fines and the rearing HQM scores were also 0.33 (poor). Other limitations to both spawning and rearing habitat quality included the lack of instream cover and low instream complexity. High water temperatures (up to 19.1°C) further reduce rearing habitat quality. No fish were observed in this reach, but one crayfish was observed.

No drops were observed in this reach, however, water depths were consistently less than 12 inches and often less than 6 inches. The culvert at NE 8th Street is likely to cause a velocity barrier to fish at higher flows due to its length and turns (~100 feet), although it has no drop at its outlet, is countersunk, and is at least 75% of the channel width. The two culverts at the road crossing to the gates would be fish passage barriers when the gates are closed for stormwater detention. Gradient was estimated at 1% in the lower half and 2% in the upper half (as compared to average of 1.2% in City GIS).

3.3.5 Reach 80 03-Trib

This unnamed tributary joins West Tributary on the right bank (west), just upstream of NE 8th Avenue. It is a first order stream that is very narrow, overgrown with invasive vegetation, passes through several culverts, and is bordered by private property throughout most of its length. The majority of this reach was inaccessible due to the vast distance of blackberries surrounding the stream and instead of surveying 60-meter segments, data was collected for the portions of the stream that could be reached. This resulted in two data collection points (80_03-Trib1, 80_03-Trib2). It is not known if these are fully representative of the entire stream, although it appears they are geomorphically similar to the areas not accessed. Visual observation of outfalls, large wood, and other reach wide assessments could not be made here.

The locations surveyed for the unnamed tributary were identified as glides, with a total length of 82 feet (25 m) surveyed. Wetted width varied from 0.65 feet (0.2 m) to 4.9 feet (1.5 m) and scour line widths varied from 2.3 feet (0.7 m) to 5.9 feet (1.8 m). Depths were less than 6 inches at all observed points (0.1 m). Substrate was coequally dominated by fines and gravel and was not considered spawning habitat. The rearing HQM was scored as 0.33 (poor) due to low to medium instream cover, high water temperature (up to 19.1°C), fines, and poor riparian conditions.

The riparian vegetation was dominated by red alder, blackberry, ivy, and reed canary grass. The dense cover provided shade, but little else of benefit. No wood was observed in the stream. At the locations observed, no armoring or erosion were evident.

This tributary is piped for approximately 280 feet (85 m) where it passes beneath NE 8th Street. The pipe first crosses NE 8th Street perpendicularly, then turns west to run along the south side of NE 8th Street. This culvert is likely to be a velocity barrier at high flows and a depth barrier at low flows; it is not countersunk and is of small size. Another culvert occurs beneath 126th Ave NE. The culvert entrance on the upstream side could not be located and may have collapsed or been buried under debris. Gradient was estimated at 1% (as compared to 2.6% in City GIS).

3.3.6 Reach 80 04

Reach 80_04 extends as a defined channel upstream of NE 8th Street, but becomes a densely overgrown field of reed canary grass for almost the entire reach. Within the reed canarygrass field, the vegetation has become too thick to visually locate the stream channel. Instead, the stadia rod was used to probe through the vegetation mat to find water. Numerous channels seem to have formed in the area, with no main channel. Fish passage is unlikely to be possible through this dense vegetation and shallow depths.

Two segments were surveyed in this reach (80_04-1, 80_04-2). Riffles, pools, and glides were identified, although glide occupied the majority of the length surveyed. Wetted widths ranged from 3 feet (0.9 m) to 13 feet (4 m) and scour line widths ranged from 3 feet (0.9 m) to 14 feet (4.3 m). Average depths in glides ranged from 0.3 feet (0.1 m) to 2 feet (0.6 m), and in pools 1.3 feet (0.4 m). Substrate was dominated by fines, although gravel was also a major component, but no spawning habitat was present. Rearing HQM scores included by 0.33 (poor) and 0.67 (fair), as canopy cover and instream cover were good in some locations. Water temperature was high (up to 17.8°C).

Riparian vegetation was dominated by cottonwood, red alder, willows, salmonberry, blackberries, and reed canary grass. Large wood was very sparse in this reach, and only 11 individual pieces were identified, although numerous small pieces were included in the beaver dam and more large wood could have been buried under reed canary grass. No erosion or armoring was observed in this reach.

The only culvert in this reach occurs beneath a dirt road behind apartments located at 126th Place NE that pass flow from the stormwater detention gates that would be a fish passage barrier when closed and may be a velocity barrier during high flows. Gradient was estimated between 1 and 2% (as compared to 2.2% in City GIS).

3.3.7 Reach 80 05

This reach flows entirely through pipes, a total length of approximately 1,292 feet (400 m), extending from Bellevue-Redmond Road to a point beneath an industrial area near the end of 127th Place NE. At this point, the piped section changes into Reach 80_06. No surveys were conducted for this reach. As the piped section is continuous into the lower portion of Reach 80_06, we recommend extending Reach 80_05 up to the pipe outlet at Parcel 15375. The adjoining property owner did not allow access and this piped portion was not confirmed. Such a long distance of pipe with multiple turns and complete darkness is certain to be a fish passage barrier and has been identified as such by the City in the GIS data provided for this study.

3.3.8 Reach 80_06

Reach 80_06 is a lengthy reach, approximately 3,504 feet (1,068 m) that begins in a piped section underneath the industrial area near the end of 127th Place NE. It extends a total of 220 meters before it becomes daylighted at Parcel 15375. As this piped section is continuous with the entirely piped Reach 80_05, we recommend extending Reach 80_05 up to the outlet into Parcel 15375. Then West Tributary daylights in Parcel 15375, entering a short piped section with a flood gate structure that controls the water level in a City detention basin. The detention basin was not ponded at the date of the field assessment. Measurements using aerial photography showed a representative pond width to be 130 feet (40 m). Upstream of the detention basin, the stream is piped for a short distance beneath 124th Avenue NE, and then emerges into the Metro Property.

Four segments were surveyed in this reach with glide and pool habitats identified (80_06-1, 80_06-2, 80_06-3, 80_06-4). For each segment, one long habitat unit (either glide or pool) occupied the entire length. Wetted widths ranged from 3.9 feet (1.2 m) to 5.6 feet (1.7 m) and were equal to the scour line widths. Average depths of glides ranged from 0.3 feet (0.1 m) to 1.6 feet (0.5 m) and the pool was 2 feet (0.6 m) in depth. Substrate was dominated by fines in all habitat units, although gravel was codominant in the glide at the downstream end (segment 1). No spawning habitat was present. Rearing HQM scores were 0.33 (poor) as canopy cover is low, instream cover is low to medium, fines, and high water temperature (up to 19.7°C).

Riparian vegetation was dominated by willows, reed canary grass, cattails (*Typha latifolia*), blackberries, and some red alder and cottonwood in the Metro property. A moderate quantity of large wood was present in this reach, associated with beaver activity and submerged in the detention pond area; 21 individual pieces were counted, but numerous small pieces were at/adjacent to the weir in the Metro property and there were recently-downed alder (by beavers) and possibly 10-15 buried pieces. No erosion was observed in this reach and the only armoring present was at the downstream ends of detention basin culvert (along the right bank) and downstream of the previously unmapped culvert on the Metro property. Potential fish passage barriers included a weir on the metro property (2 foot drop) and generally low flow depths (less than 12 inches in most of the reach). Gradient was estimated at 2% (same as mapped by City GIS).

This reach had the greatest length of piped flows, reaching a total of approximately 1,000 feet (330 m). This includes the initial 720 feet (220 m) of piped length, an approximately 65 foot (20 m) culvert at the downstream end of the detention basin, a 150 foot (45 m) culvert beneath 124th Ave NE, and a previously unmapped piped section located on the Metro Property, passing beneath the bus ingress road leading west from 124th Avenue NE, which is also approximately 150 feet (45 m) in length. None of these culverts had drops at their inlet, but were not countersunk, and were generally less than 75% of the channel width, thus likely presenting partial fish passage barriers at high flows and insufficient depths at low flows. Gradient was estimated between 1 and 2% (as compared to 0.4% in City GIS).

3.3.9 Reach 80_07

Reach 80_07 includes only the piped section that passes beneath 120th Avenue NE, which extends a total length of approximately 330 feet (100 m). This area was not surveyed. This culvert is likely to be a fish passage barrier with such a long distance of pipe. It is not countersunk and would likely be a velocity barrier at high flows.

3.3.10 Reach 80_08

Reach 80_08 is a short reach, approximately 137 feet (316 m) located upstream of 120th Avenue NE. This was the upstream-most reach surveyed. One reach segment was surveyed (80_08-1), with a single pool habitat unit identified. This reach is a beaver pond/wetland complex. A beaver dam approximately 5 feet high is located approximately 15 feet upstream of the culvert at 120th Avenue NE. No specific channel is present, except immediately upstream/downstream of the beaver dam, and multiple ponds/channels are present extending for a width of approximately 100 feet (30 m), equal to the scour width. Average depth was 1.6 feet (0.5 m). Substrate was entirely fines and organic muck (ponded areas could not be walked as fines/muck extended down 2 or more feet). No spawning habitat is present.

Riparian and wetland vegetation was more diverse in this reach than in any other reaches, and included cottonwood, willows, red-osier dogwood, cattails, and small-fruited bulrush. Notably, invasives including reed canary grass, blackberries, and purple loosestrife (*Lythrum salicaria*) were present in patches, although not as widespread as in other reaches. Large wood was fairly extensive in this reach, with an estimated 100 pieces present, including submerged wood. The rearing HQM score was 0.67 (fair) as the canopy cover and instream cover are moderate. Water temperature (not measured) and fines limit rearing habitat quality. Gradient was estimated as 0% (as compared to 0.1% in the City GIS).

At the upstream end of the reach there is no channel and there was no water present for approximately 75 feet (23 m) downstream of the railroad culvert. At approximately 75 feet downstream, the soil is saturated and the wetland begins.

There were no piped sections of stream in this reach as it ended at the railroad culvert. However, the railroad culvert is the only culvert in the West Tributary that is perched, with a drop of approximately 1 foot and a scour hole with small rock beneath. This culvert is also about half-filled with sediment and was dry (no flow) at the time of the field assessment. The beaver dam immediately upstream of the culvert at 120th Avenue NE poses a potential flood hazard as it could block the culvert, if breached.

Table 1. Reach segment data results.

Reach Segment	Habitat Unit	HU Length (m)	Wetted Width (m)	Scour Width (m)	Average Depth (m)	Temp (C)	Gradient (%)	Canopy Cover (%)	Instream Cover	Spring Influence	Spawning HQM	Rearing HQM	Substrate (%)				C	n 6)	Non-Native Cover (%)	
													F	G	С	В	Т	S	Н	
76_04-1	Pond	11.5	15.0	15	1.2	17.7	0	5	Low	3	0	0.33	100	0	0	0	10	35	75	75
70_04*1	Glide	48.5	3.6	3.6	0.6	17.5	0	10	Med	3	0	0.33	95	5	0	0	25	45	75	60
80_01-1	Glide	60	2.3	2.3	0.5	18.4	<1	50	Low	3	0	0.33	50	50	0	0	35	35	50	50
	Glide	22.5	2.4	2.4	0.5	19.9	<1	80	Low	3	0	0.33	50	10	40	0	80	60	50	30
00.04.0	Riffle	30.6	2.4	2.4	0.2	19.9	<1	85	Low	3	0	0.33	35	40	25	0	85	55	40	35
80_01-2	Glide	10.5	3.3	3.3	0.3	19.9	<1	70	Low	3	0	0.33	50	10	40	0	70	50	30	30
	Riffle	18.9	2.7	2.7	0.2	19.8	<1	80	Low	3	0.33	0.33	30	65	5	0	80	50	40	40
80_01-3	Riffle	60	2.3	3.4	0.1	17.3	2	60	Low	2	0	0.33	55	40	5	0	60	0	90	40
	Pool	3.3	2.7	2.7	0.3	17.6	2	0	Low	3	0	0.33	50	50	0	0	0	0	100	95
	Riffle	2.3	2.4	3.5	0.2	17.6	2	0	Low	2	0.33	0.33	50	50	0	0	0	0	100	95
80_02-1	Pool	5.0	2.0	3.0	0.4	17.7	2	0	Med	2	0	0.33	50	30	20	0	0	0	100	95
	Glide	8.8	2.7	2.7	0.2	17.8	2	0	Low	3	0	0.33	40	20	35	5	0	0	100	95
	Riffle	41.0	2.3	2.3	0.1	17.8	2	0	Low	3	0.33	0.33	30	60	10	0	0	80	20	95
80_02-2	Riffle	60	1.8	2.7	0.1	18.8	3	75	Med	2	0.33	0.33	20	45	10	25	60	40	10	60
	Riffle	16.6	3.1	3.9	0.1	19.0	1	40	Low	2	0.33	0.33	25	45	20	10	40	5	55	50
80_03-1	Glide	7.0	2.7	3.0	0.1	19.0	1	40	Low	2	0	0.33	35	45	20	0	40	10	50	50
	Riffle	36.8	2.3	2.3	0.1	19.1	1	75	Low	3	0.33	0.33	25	40	30	5	75	30	25	40

Reach Segment	Habitat Unit	HU Length (m)	Wetted Width (m)	Scour Width (m)	Average Depth (m)	Temp (C)	Gradient (%)	Canopy Cover (%)	Instream Cover	Spring Influence	Spawning HQM	HQM Rearing HQM		Substra	te (%)		C	Non-Native Cover (%)		
		Τ.					_						F	G	С	В	Т	S	Н	
	Riffle	26.4	3.4	3.8	0.1	16.1	2	70	Med	2	0.67	0.33	20	75	5	0	70	60	30	40
80_03-2	Glide	18.3	2.8	2.9	0.3	16.1	2	5	Med	2	0	0.33	30	65	5	0	5	15	35	30
00_03-2	Riffle	12.3	3.0	3.0	0.2	16.3	2	65	Low	3	0.33	0.33	25	20	40	15	65	5	30	30
	Glide	16	2.4	2.4	0.2	16.3	2	35	Med	3	0	0.67	30	20	50	0	35	10	75	60
80_03-Trib-1	Glide	15	1.5	1.8	0.1	16.9	1	35	Med	2	0	0.33	50	40	10	0	35	60	30	90
80_03-Trib-2	Glide	10	0.2	0.7	0.1	15.1	1	90	Low	1	0	0	30	70	0	0	90	60	50	75
	Riffle	9.4	3.3	3.3	0.1	16.0	1-2	20	Med	2	0	0.33	50	50	0	0	25	25	40	20
	Glide	20.9	1.8	2.1	0.1	16.1	1-2	30	Med	2	0	0.67	50	45	0	5	30	60	35	75
80_04-1	Pool	3.1	3.2	3.8	0.3	16.1	1-2	75	Low	2	0	0.33	60	40	0	0	75	30	60	85
	Glide	17	4.0	4.3	0.1	16.1	1-2	50	Med	2	0	0.33	40	60	0	0	50	40	30	40
	Pool	16	3.2	3.2	0.4	16.1	1-2	50	Med	2	0	0.67	65	35	0	0	50	50	15	15
80_04-2	Glide	60	0.9	0.9	0.6	17.8	1	0	Med	3	0	0.33	100	0	0	0	5	5	100	95
80_06-1	Glide	60	1.2	1.2	0.3	-	2	10	Med	3	0	0.33	60	40	0	0	10	60	50	60
80_06-2	Glide	60	1.5	~40	0.1	19.7	1-2	20	Low	1	0	0.33	100	0	0	0	20	30	50	80
80_06-3	Pool	60	1.2	1.2	0.6	18.2	1-2	5	Med	3	0	0	100	0	0	0	5	5	100	95
80_06-4	Glide	60	1.7	1.7	0.5	17.0	1-2	50	Med	3	0	0.33	35	65	0	0	25	30	90	90
80_08-1	Pool	60	30	30	0.5	-	0	30	Med	3	0	0.67	>90	0	0	0	20	10	100	75

3.3.11 Prioritization Index (WDFW)

The WDFW prioritization index was used to estimate habitat and production potential above the identified fish passage barrier culverts and for the entire stream as a whole (even though there are no barriers below NE 8th Street). The downstream-most culvert that is likely a fish passage barrier is at NE 8th Street and the adjacent upstream culverts/gates at the detention basins. There is no spawning habitat on the West Tributary upstream of NE 8th Street, so the prioritization index only calculated rearing habitat upstream of that point. Inputs in the spreadsheet are directly from the field data.

West Tributary (including unnamed tributary): Prioritization Index (PI) based on all reaches. Reaches 80_05 and 80_07 that are piped are included in the immediate upstream reach.

NE 8th Street. Prioritization Index based on Reach 80_04 only (only reach to be made accessible by only replacing NE 8th Street culvert and modifying culverts/gates to ensure fish passage):

Bellevue-Redmond Road. Prioritization Index based on Reach 80_06 only

120th Avenue NE. Prioritization Index based on Reach 80 08 only

$$PI_{total} = PI_{coho} + PI_{chinook} + PI_{steelhead} + PI_{cutthroat} = (2.6+3.2+1.6+2.2) = 9.6$$

4.0 RESTORATION NEEDS AND OPPORTUNITIES

Restoration and stormwater or flood reduction opportunities are available throughout West Tributary, although in the most urban portions, opportunities may be limited. The following sections describe the restoration opportunities at each reach, using their current numbering designations, and the limitations that exist. Figure 13 shows these opportunities on an overview map.

Reach 76_04. This reach is of moderate to good rearing quality overall with beaver ponds and wetlands. Part of this reach is protected within Kelsey Creek Park, but the upper half is within private properties. The primary opportunities for habitat enhancement and restoration within this reach are control of invasive plant species, primarily reed canary grass and blackberries, plantings of native trees and shrubs to improve shading and contribute to the long-term recruitment of large wood, and placement of large wood in the stream and wetlands. As the West Tributary overall appears to have a high groundwater table, it is important to maintain low water temperatures as much as possible in the stream, so additional shading and cover will help to maintain cooler water temperatures for high quality rearing habitat for juvenile salmonids and to benefit Kelsey Creek water temperatures.

Reach 80_01. This reach is of moderate to good rearing quality through Kelsey Creek Farm Park and of poor quality through the Glendale Country Club golf course. The primary opportunities for habitat enhancement and restoration within this reach are within the golf course and include sloping the creek banks back to minimize erosion and reduce the need for armoring, removal of armoring, replanting with native trees and shrubs and installation of bank logs to form pools and provide cover. The most important concerns for this reach are to provide shading to maintain cooler water temperatures and to reduce the input of fine sediments from bank erosion. Pedestrian bridges may need to be widened to accommodate bank layback. A riparian buffer will also filter fertilizers and herbicides that may be used on the golf course. If possible, restoring some meanders would also promote pool and riffle formation. This reach could provide potential spawning habitat if enhanced.

Reach 80_02. This reach primarily runs through residential properties and is confined by relatively steep and moderately high banks. The primary concerns in this reach are the flood-risk culvert at NE 1st Street, debris and armoring, and the need to maintain shading and tree canopy cover. As there are so many small residential property owners, enhancement opportunities may be limited. Replacing the culvert at NE 1st Street with a larger (both wider and higher clearance) culvert, but recreating a narrower low-flow channel through the culvert would help to convey sediment and reduce flood and debris jamming concerns. The property owner upstream of the culvert may be willing to allow better riparian enhancement if the flooding issues are resolved (they have been working with the King County Conservation District on limited riparian plantings). Working with landowners to remove riprap and other debris that has fallen into the stream would improve spawning habitat potential, and wood could be installed to replace this debris, primarily anchored into the banks. Removal of armoring would likely cause erosion of the banks as there is so little room available. The City could consider a tax incentive to landowners to maintain and enhance riparian vegetation or to retain trees and plant native shrub cover. Landowners with fences crossing the creek could be encouraged to find other property protection features such as thorny shrub hedges (i.e. native roses).

The weirs upstream and downstream of NE 3rd Street may have been installed to promote backwatering and stability of the culvert, but should be notched further or reconfigured to ensure passability by both juvenile and adult salmonids.

Reach 80_03. Similar to Reach 80_02, this reach primarily runs through residential properties and is confined by moderately high banks. The primary concerns in this reach are debris and armoring, and the need to maintain shading and tree canopy cover. As there are so many small residential property owners, enhancement opportunities may be limited. Working with landowners to remove riprap and other debris that has fallen into the stream would improve spawning habitat potential, and wood could be installed to replace this debris, primarily anchored into the banks. Removal of armoring would likely cause erosion of the banks as there is so little room available. The City could consider a tax incentive to landowners to maintain and enhance riparian vegetation, or to retain trees and plant native shrub cover.

The culvert at NE 8th Street is likely a partial fish passage barrier due to its length and velocities at high flows. This would be an expensive culvert to replace and would not provide access to spawning habitat in the West Tributary (although spawning habitat may be available in Goff Creek), but would provide access to rearing habitat in Reach 80_04. Low pedestrian bridges will likely be damaged during floods; the City could consider a tax incentive for landowners to raise or eliminate pedestrian bridges.

Reach 80_03_01. This unnamed tributary functions essentially as a drainage corridor from commercial and residential properties and it may only have seasonal flow (should be confirmed by observation in late summer). The culvert at NE 8th Street is likely a fish passage barrier due to its length, corners, and high velocities during high flows. There is little to no habitat potential in this reach, so providing fish access does not seem warranted. The primary concerns with this reach are to reduce fine sediment transport into the West Tributary and to maintain shading and provide a riparian buffer for filtering potential pollutants. The riparian corridor is entirely dominated by blackberries and ivy, although some tree canopy is present. The City could consider a tax incentive to landowners to maintain and enhance riparian vegetation, to retain trees, control invasive species, and plant native shrub cover.

The culvert under 126th Avenue NE may be buried or collapsed. This should be investigated to determine if it should be replaced as it could cause a flood risk concern.

Reach 80_04. This reach is of moderate quality and is primarily a wetland complex. The primary concerns in this reach are the lack of a defined channel due to reed canary grass invasion and the fish passage concerns with the culverts and gate structure. The key enhancement and restoration opportunities are control of invasive species, which could potentially be drowned out by impounding this reach by using the gates. Then, replanting with a dense and diverse mix of native trees and shrubs and herbaceous cover would help to prevent reed canary grass

recolonization. Placement of wood in the wetland complex (anchored) would provide cover and habitat for multiple species.

Reach 80_05. This reach is piped for its entire length. This would be a major expense to daylight and there is a limited corridor available. If there is an opportunity to daylight portions of this reach, the primary enhancement opportunities would be to provide a riparian corridor and create a coarse substrate channel to minimize inputs of fine sediment.

Reach 80_06. This reach is currently designated to include the piped segment between 127th Place NE and Parcel 15375, which we have recommended including in Reach 80_05. However, this segment of pipe may be most conducive to daylighting as there is lesser use of this area for various commercial activities.

The primary concerns in this reach are the lack of a defined channel due to reed canary grass invasion and the fish passage concerns with the detention gate structure. As there is no spawning habitat available in this reach or upstream, fish passage concerns are of a lower priority and the detention gates could potentially be used to drown out reed canary grass. Then, replanting with a dense and diverse mix of native trees, shrubs, and herbaceous cover would help to prevent reed canary grass recolonization. Placement of wood (anchored) in the wetland complex (downstream of 124th Avenue NE) would provide cover and habitat for multiple species.

In the Metro property, the potential for reconfiguring the weir or adding a secondary weir to reduce the drop height and replacing the culverted section with a bridge should be considered. Other primary enhancement and restoration opportunities would be to remove debris, control invasive species, and plant native trees and shrubs for canopy cover. It is important to maintain cooler water temperatures and minimize the input of fine sediments through this reach, even if fish passage is not a feasible option.

Reach 80_07. This reach is entirely piped along 120th Avenue NE. This would be a major expense to daylight and there is limited corridor available. If there is an opportunity to daylight this reach, the primary enhancement opportunities would be to provide a riparian corridor and create a coarse substrate channel to minimize inputs of fine sediment.

Reach 80_08. This reach generally is of moderate quality and functions as a headwater wetland complex. There is no spawning habitat available. The primary habitat enhancement and restoration opportunities are to control invasive species and enhance the diversity and shading of the wetland by planting native tree species around the perimeter and on planting mounds that could be placed in the wetland. There is the most large wood in the stream in this reach, so placement of additional wood is a low priority, but could be accomplished for any trees removed associated with invasives control or placement of planting mounds.

The culvert under 120th Avenue NE is likely a flood risk due to potential clogging by the beaver dam wood.

5.0 DISCUSSION AND RECOMMENDATIONS

The selected protocols and data collection tools were found to work in most cases, with only a few exceptions. This section describes the data collection protocols that were modified during field investigations and the reasons for those decisions, the utility of the tools used and recommendations for improving them, a review of the most time consuming components of the investigation effort, and recommendations for improvements.

5.1 CHANGES TO PROTOCOL

5.1.1 Data Collected and Effort Required

Large Wood. West Tributary has abundant beaver activity, resulting in an abundance of smaller sized wood and it was quickly decided that it would not be feasible to keep an accurate count using the Montgomery size class guide (Montgomery 2008). Instead, we noted the general presence of the smallest Montgomery size classes (A1)

and kept count only of the larger pieces, including B1 or greater size classes. Indications of numerous small pieces are described in the data sheets and reach descriptions.

Wolman Pebble Counts. Wolman pebble counts were only done in areas where coarse substrate was dominant. The narrowness of the channel and presence of boulders (riprap) made the accuracy of the counts lower than desirable as fine sediment was typically under larger particles, thus skewing the results toward larger gradations. This is acceptable for the purposes of hydraulic modeling (i.e. estimating channel bed roughness), but is not suitable for habitat quality assessment.

5.1.2 Field Equipment

Measuring Tape. We found that it was not necessary to use a hip chain to gain accurate measurements of the stream habitat units, as required in the WDFW protocol. Instead, a 60-meter measuring tape allows the habitat unit length to be measured and then quickly converted for measurement of smaller lengths, such as wetted width and scour width, reducing the number of measurement tools needed in the field.

Gradient. Gradient was difficult to accurately collect due to short sight distances from stream meanders or dense vegetation. Measuring short distances with a clinometer did not provide accurate, even when using a survey rod for sighting. Thus, gradient was visually estimated, but it is recommended that gradient be mapped using City topography in GIS. For the West Tributary, there were no significant grade breaks as all reaches were approximately 2% or less. Unless the City is aware of streams within their jurisdiction with significant grade breaks, we recommend only documenting drops at weirs or other features.

GPS Placemarks. In most cases, the Trimble GPS unit provided more accurate placemarking than the tablet GPS application. However, in many locations, the Trimble GPS was unable to collect satellite data due to heavy canopy cover and the tablet GPS application was a suitable alternative. Although the tablet GPS does not provide pinpoint accuracy, it was found to provide placemarks nearly as accurate as the Trimble GPS; this was best achieved by displaying georeferenced project maps into the application PDF Maps. PDF Maps provides a continual GPS location of the tablet within the predesigned project mapping, allowing users to see where they are in reference to known reach breaks, street crossings, or other known locations. The tablet user can drop a pin directly into the PDF Map, but also move that pin into a more accurate position, using the project maps as a guide.

Tablet. We found that the use of a tablet for this data collection effort was efficient during preparation, in the field, and in managing data after the field work was done. It provides one field investigator the ability to collect field data in a predesigned data sheet, to take photos, and to record placemarks. No separate camera or handheld GPS unit is needed. However, we did find that it was difficult and/or time consuming for one investigator to be responsible for recording all the data. It was determined that two solutions are possible; use two tablets or use one tablet and bring hardcopy data sheets. With two tablets, one field investigator can collect photos, placemarks and reach-wide data, while the other investigator collects the reach segment data. With one tablet and hardcopy data sheets, the same affect can be achieved without needing two tablets.

5.2 PROTOCOL CHALLENGES

Modified Full Survey Plus Additional Data Collection. The greatest challenge for efficient data collection was the need to walk the entire length of each reach. In particular, it was difficult to coordinate the collection of reach segment data (the 60 meters of every 320 meters under the Full Study described by the WDFW protocol) and then continue to try to characterize the remaining 260 meters of the reach for only a portion of those parameters.

Collecting the additional 260 meters of data takes a substantially greater amount of time; (1) simply from walking five times more stream length, (2) because many areas are densely overgrown and take substantial effort to clear a path, (3) switching from one location to another could require decontamination for preventing the spread of New Zealand mud snails, (4) logistics of walking both upstream and downstream to bypass parcels with no access

permission, and (5) to allow for stopping to placemark, photo, and/or describe each outfall, armoring or erosion locations, count each piece of wood, any fish observed, fish passage barriers, and potential spawning habitat.

Although many of these parameters fall outside the WDFW protocol, they are still important pieces of data and provide a greater understanding of stream conditions. A key decision point for the City will be whether a rapid assessment for habitat is more desirable than a more comprehensive data collection of more features. To conduct only the WDFW habitat assessment, the time required is an average of 1.5 hours for each segment surveyed (depending on density of vegetation or difficulty to access), which translates to approximately 1 mile of stream sampled per day. For reaches that are entirely accessible (i.e. entirely within public land), up to 1.5 miles could be sampled in one day. Adding the additional data collection increases time to 2.5 hours per 1,050 feet (200 m), translating to one and a half days per mile.

Wolman Pebble Counts. Conducting Wolman pebble counts is particularly time consuming, since at least 100 measurements must be made within each riffle and because West Tributary is narrow and requires a high number of transects to complete the counts. We estimated that this added about 30 minutes to data collection at riffle habitat units. Wolman pebble counts should be a more reliably accurate estimation of fines and embeddedness when compared to visual estimation, which can vary widely between investigators. Visual estimations of fines for this protocol require that an entire HU be assessed for fines, while the pebble count typically considers a smaller area. It is recommended that one pebble count be conducted per reach along with visual estimation at habitat units, to provide the better estimation of potential spawning habitat.

Accessibility/Rights-of-Entry. Because West Tributary is an urban stream system there were challenges to gaining access to the entire stream length of interest. In particular, several segments could not be observed as a result of lacking rights of entry or from the presence of densely overgrown vegetation. These are described above in each reach description. However, even without observing these segments, the data collected is representative of each reach and adequately describes conditions.

5.3 PROPOSED REACH BREAK MODIFICATIONS

Reach 80_02. As described, this reach would be the portion of West Tributary that runs through the golf course. Currently, Reach 80_02 begins at a point approximately 50 meters from the end of the golf course property. However, the change in the stream conditions between the golf course and the adjacent residential area is distinct. It is recommended that this reach begin where the golf course ends and the home properties along NE 1st Street begin. With the new Reach 80_02 through the golf course, this new reach would become 80_03 and subsequent reaches would need to be renumbered.

Reach 80_05. Following confirmation that the entirety of Reach 80_05 is piped, it would make sense to extend that reach through the rest of the piped portion that is currently considered Reach 80_06. Reach 80_06 would then be revised to begin where Parcel 15375 begins.

All other reach breaks were confirmed to represent reasonable changes in geomorphic conditions.

6.0 REFERENCES

- City of Bellevue. 2009. Final Report City of Bellevue Stream Typing Inventory. Prepared by the Watershed Company. Available at: https://www.bellevuewa.gov/pdf/Utilities/Streamtyping_Report.pdf.
- City of Bellevue. 2016. Storm and Surface Water System Plan. Available at: http://www.ci.bellevue.wa.us/storm-surface-water-plan.htm on the Web.
- Montgomery, D.R. 2008. A Simple Alphanumeric Classification of Wood Debris Size and Shape. Stream Notes; Rocky Mountain Research Station. Available at: http://gis.ess.washington.edu/grg/publications/pdfs/Montgomery_StreamNotes_Oct2008.pdf.
- Washington Department of Fish and Wildlife (WDFW). 2009. Fish Passage Barrier and Surface Water Diversion Screening Assessment and Prioritization Manual. Washington Department of Fish and Wildlife Habitat Program, Olympia, WA. Available at: http://wdfw.wa.gov/publications/00061/ on the Web.
- Washington State Legislature. 2016. Fresh water designed uses and criteria. WAC 173-201A-200. Available at: http://apps.leg.wa.gov/WAC/default.aspx?cite=173-201A-200.

7.0 FIGURES

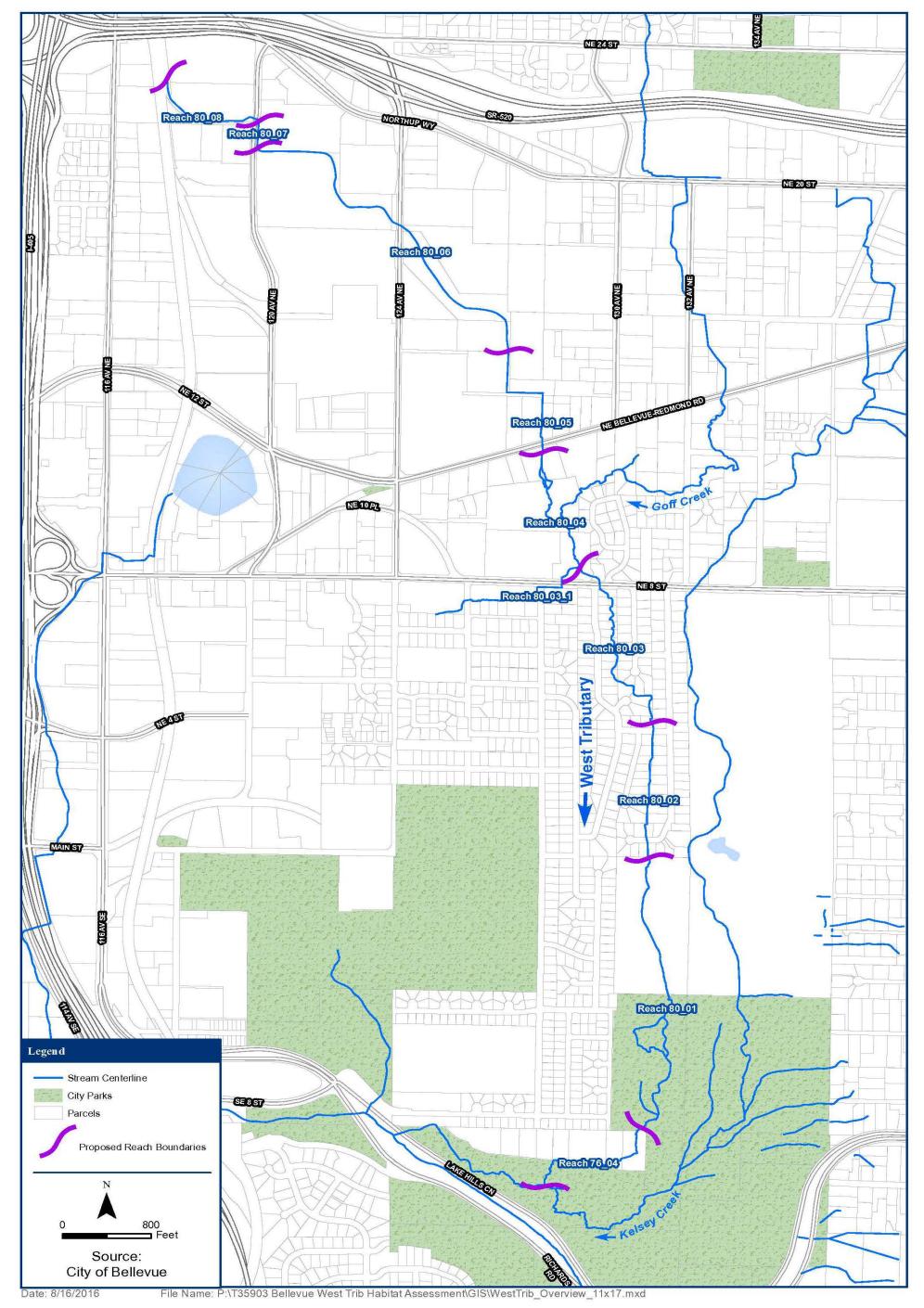


Figure 1. Overview of Reaches on West Tributary Stream

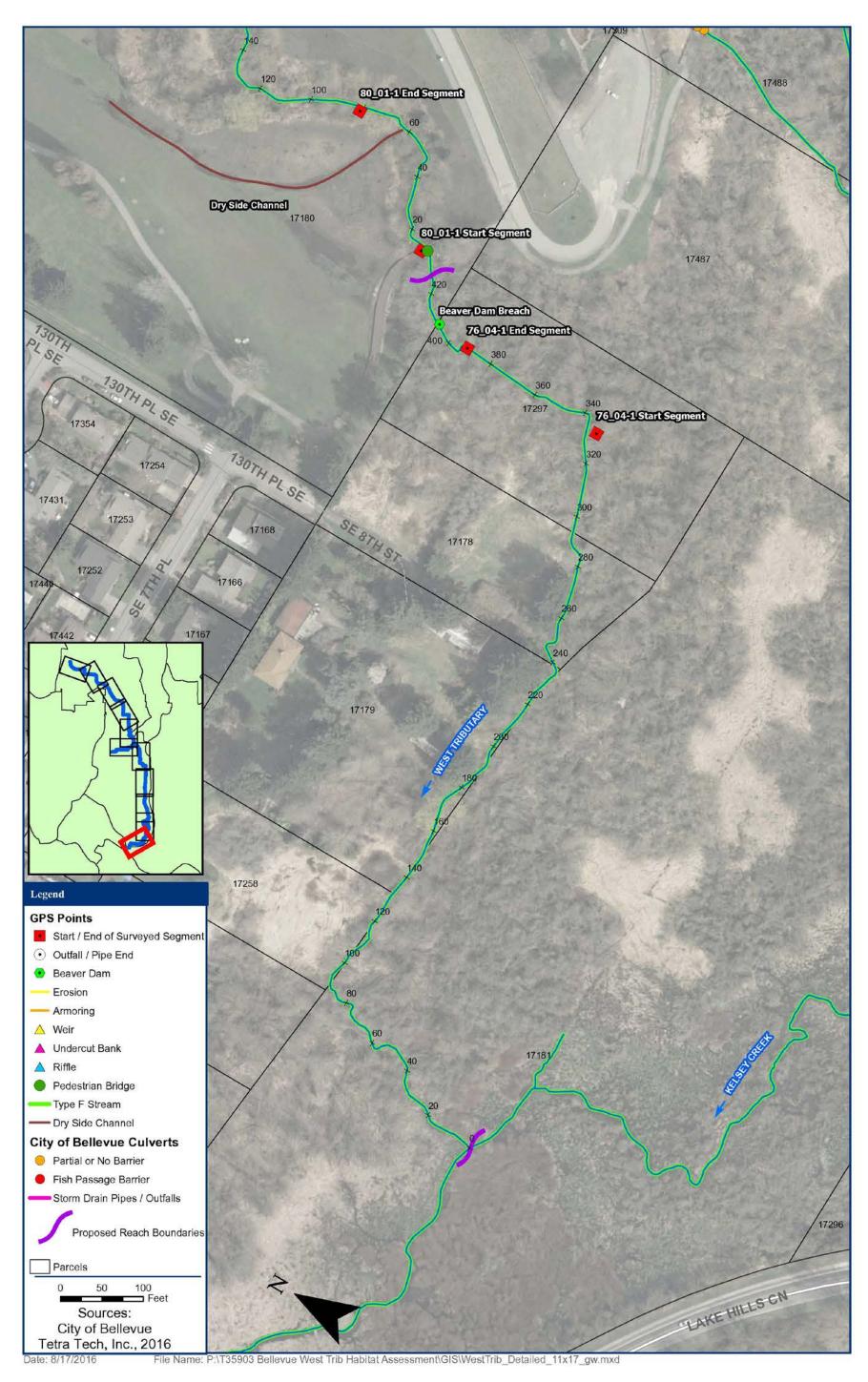


Figure 2. Detailed Reach Segment and Features Map 1 of 11

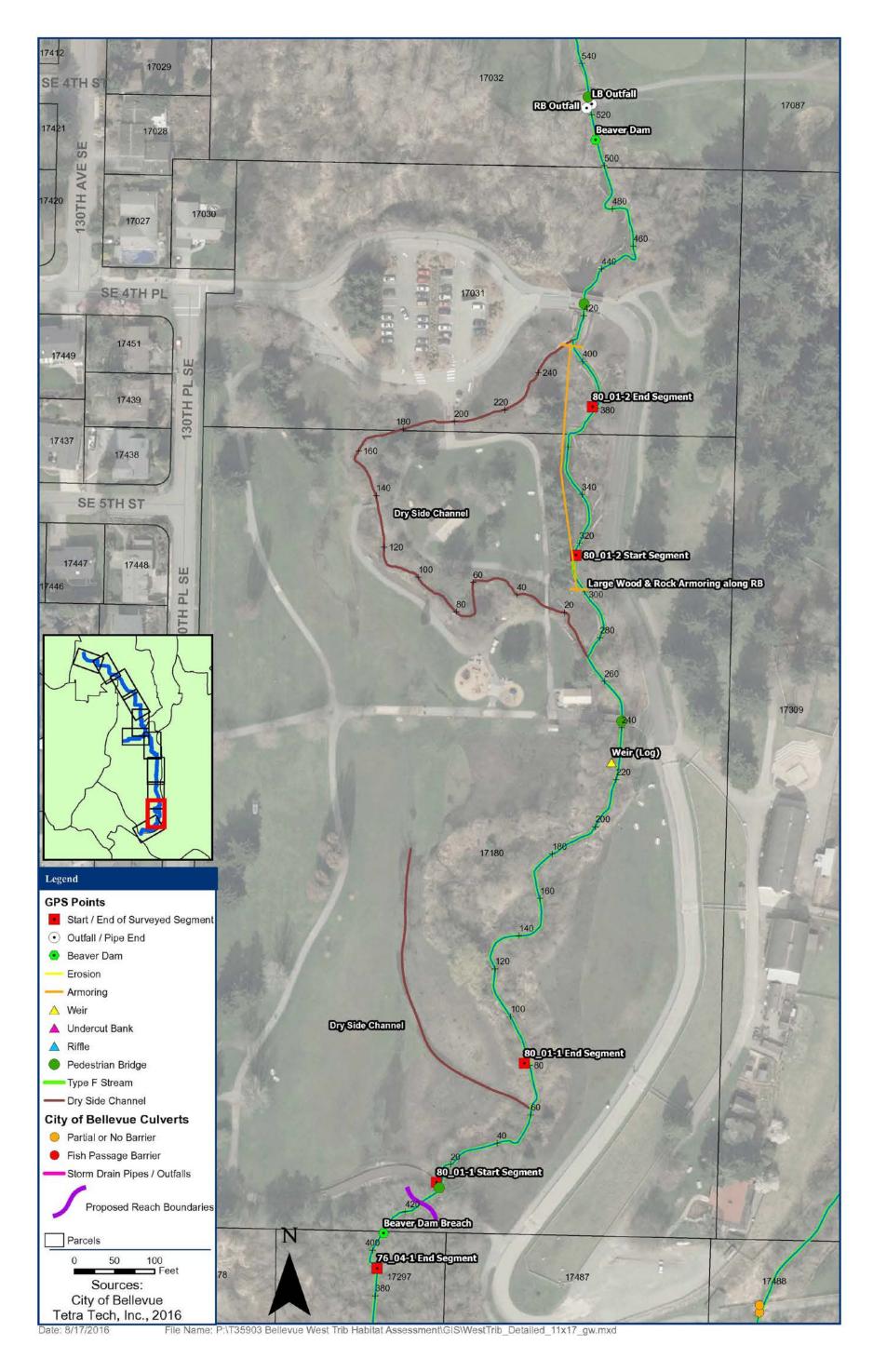


Figure 3. Detailed Reach Segment and Features Map 2 of 11

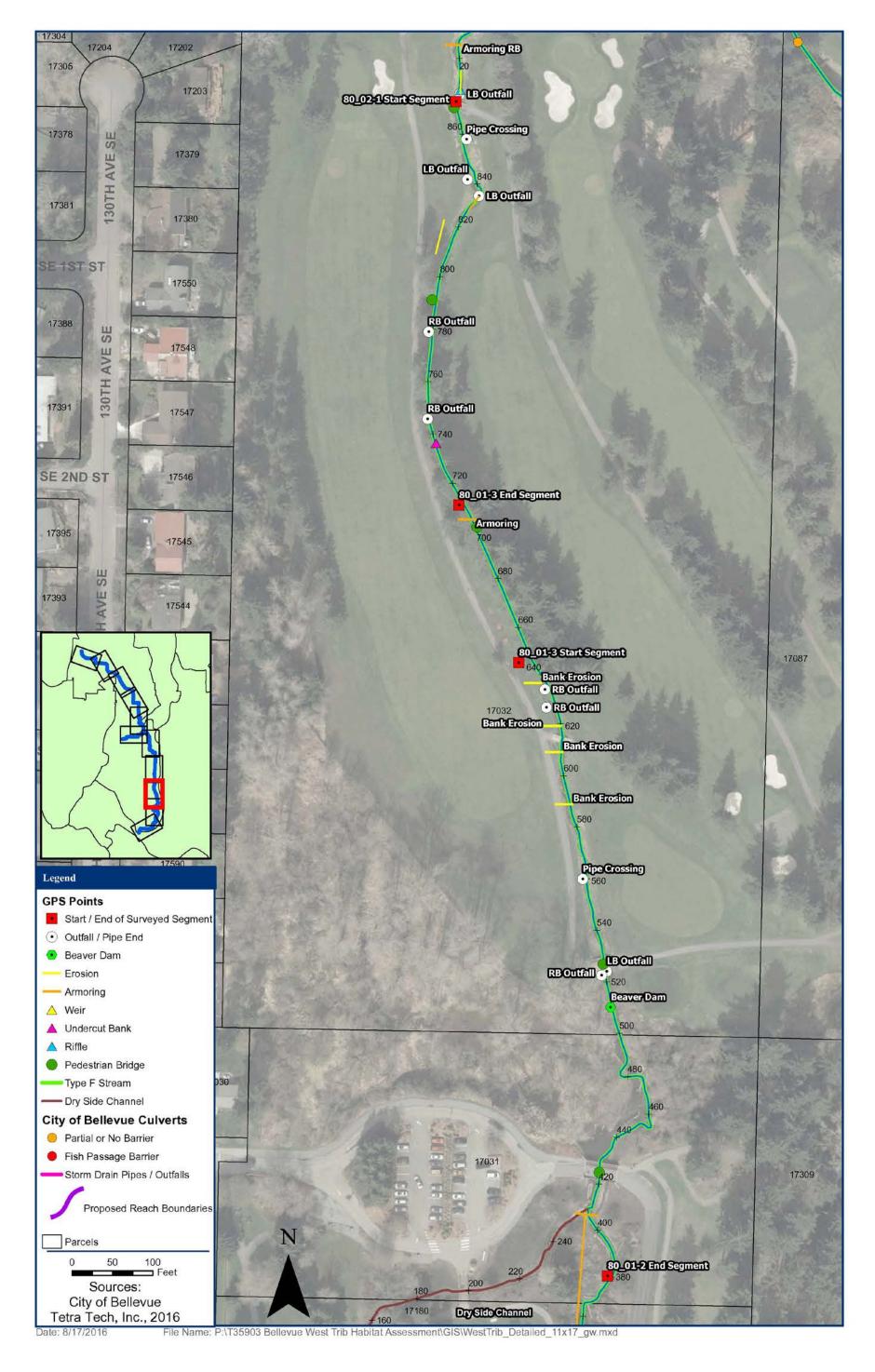


Figure 4. Detailed Reach Segment and Features Map 3 of 11

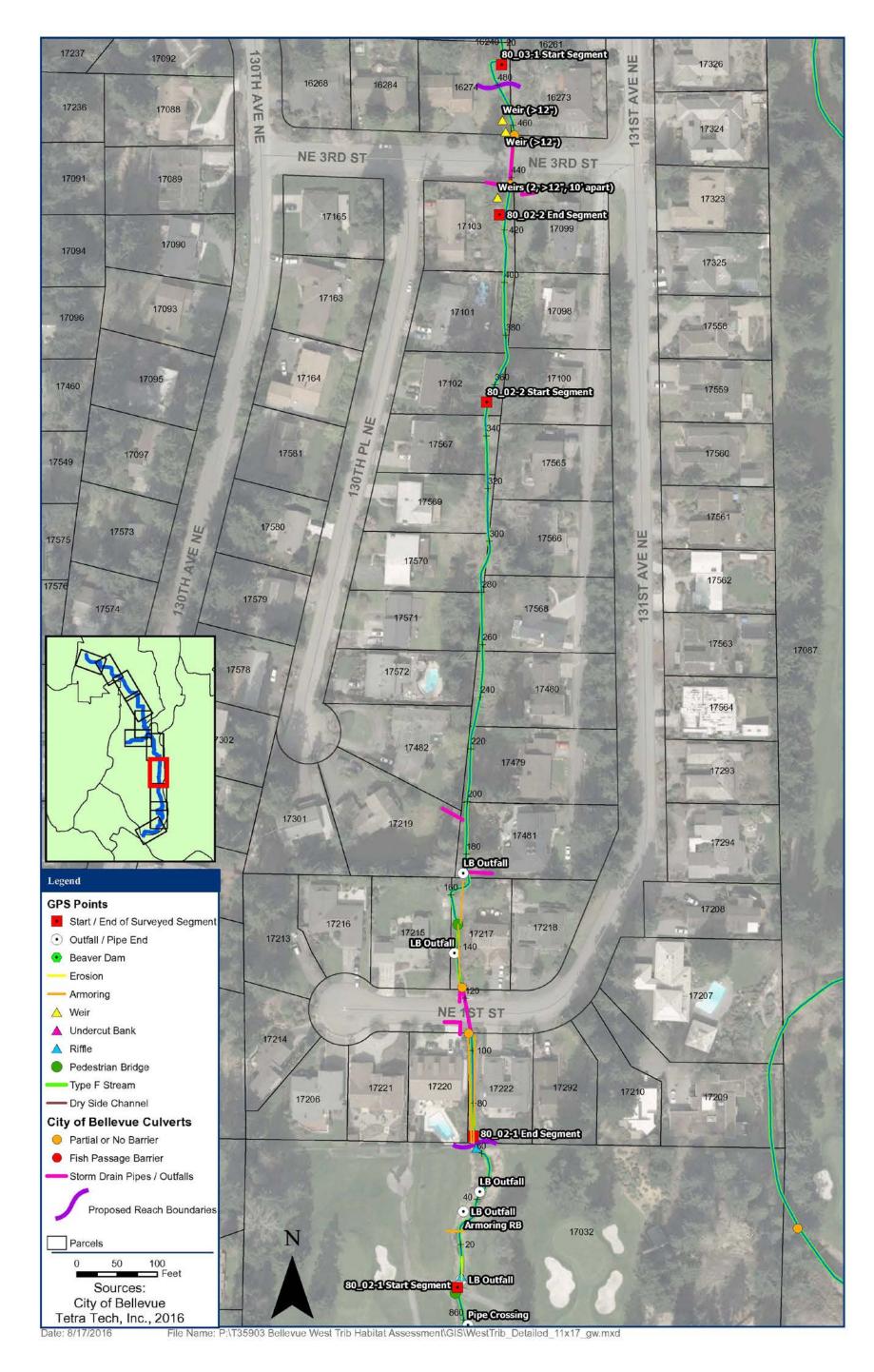


Figure 5. Detailed Reach Segment and Features Map 4 of 11

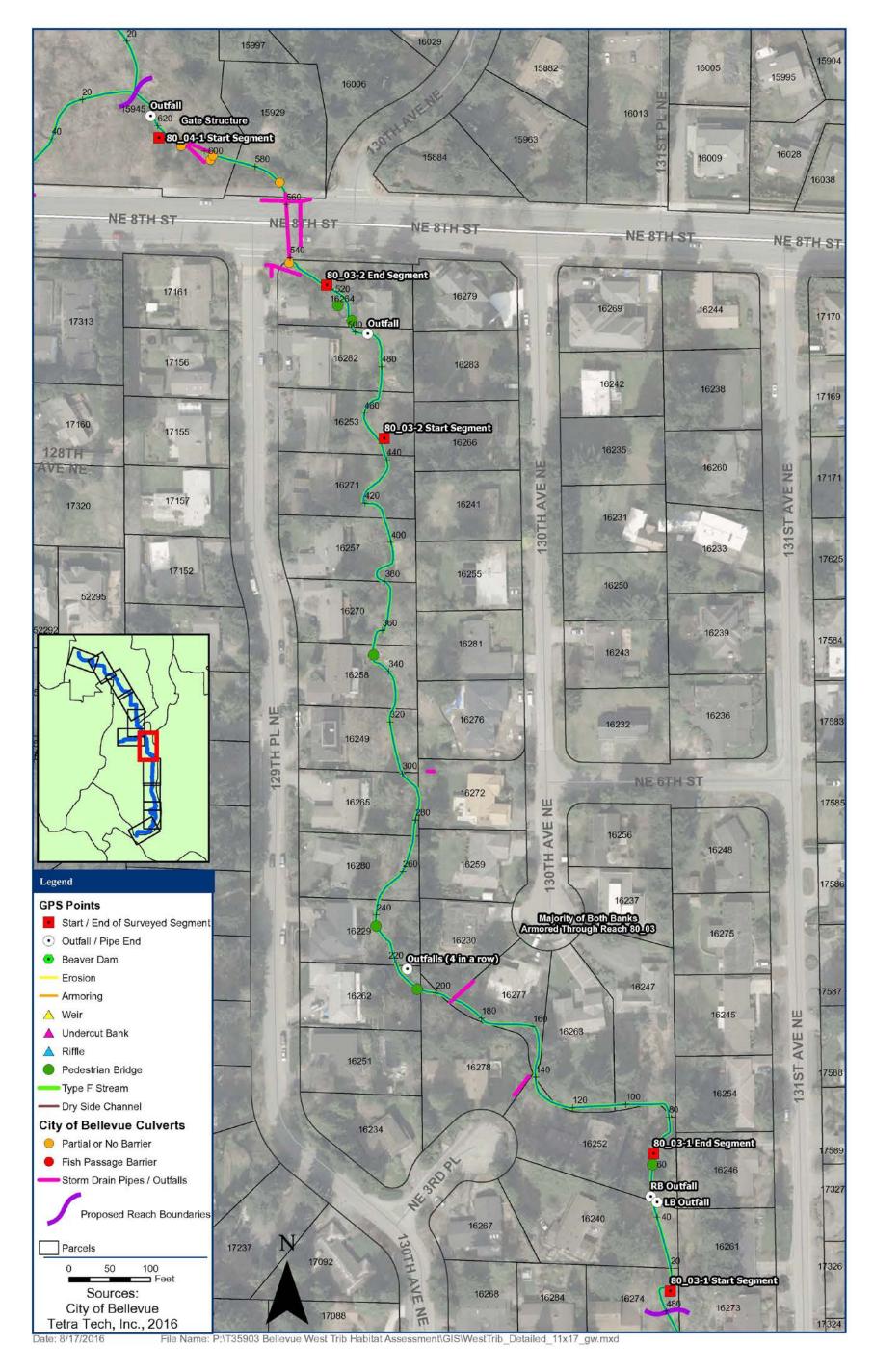


Figure 6. Detailed Reach Segment and Features Map 5 of 11

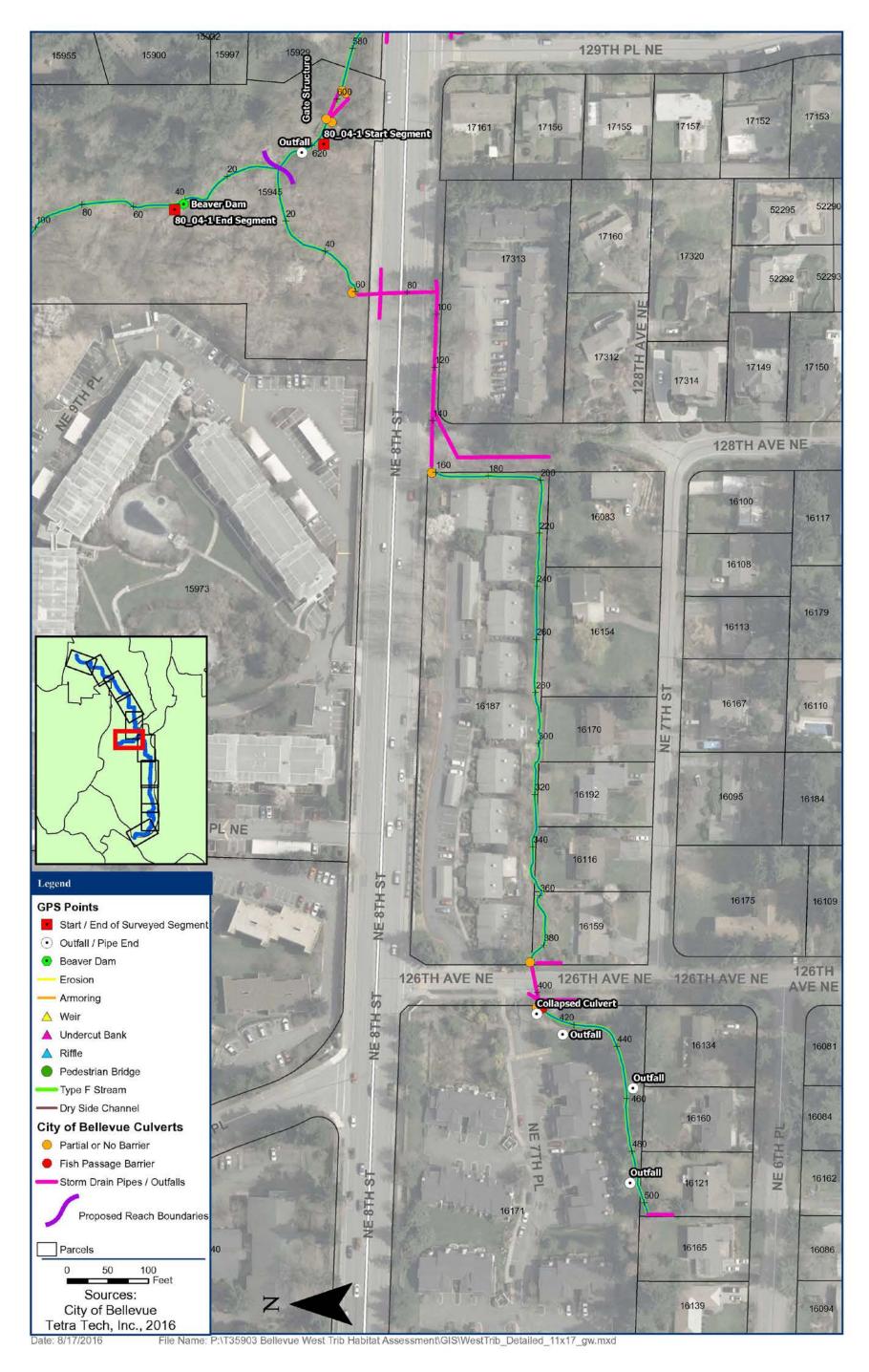


Figure 7. Detailed Reach Segment and Features Map 6 of 11

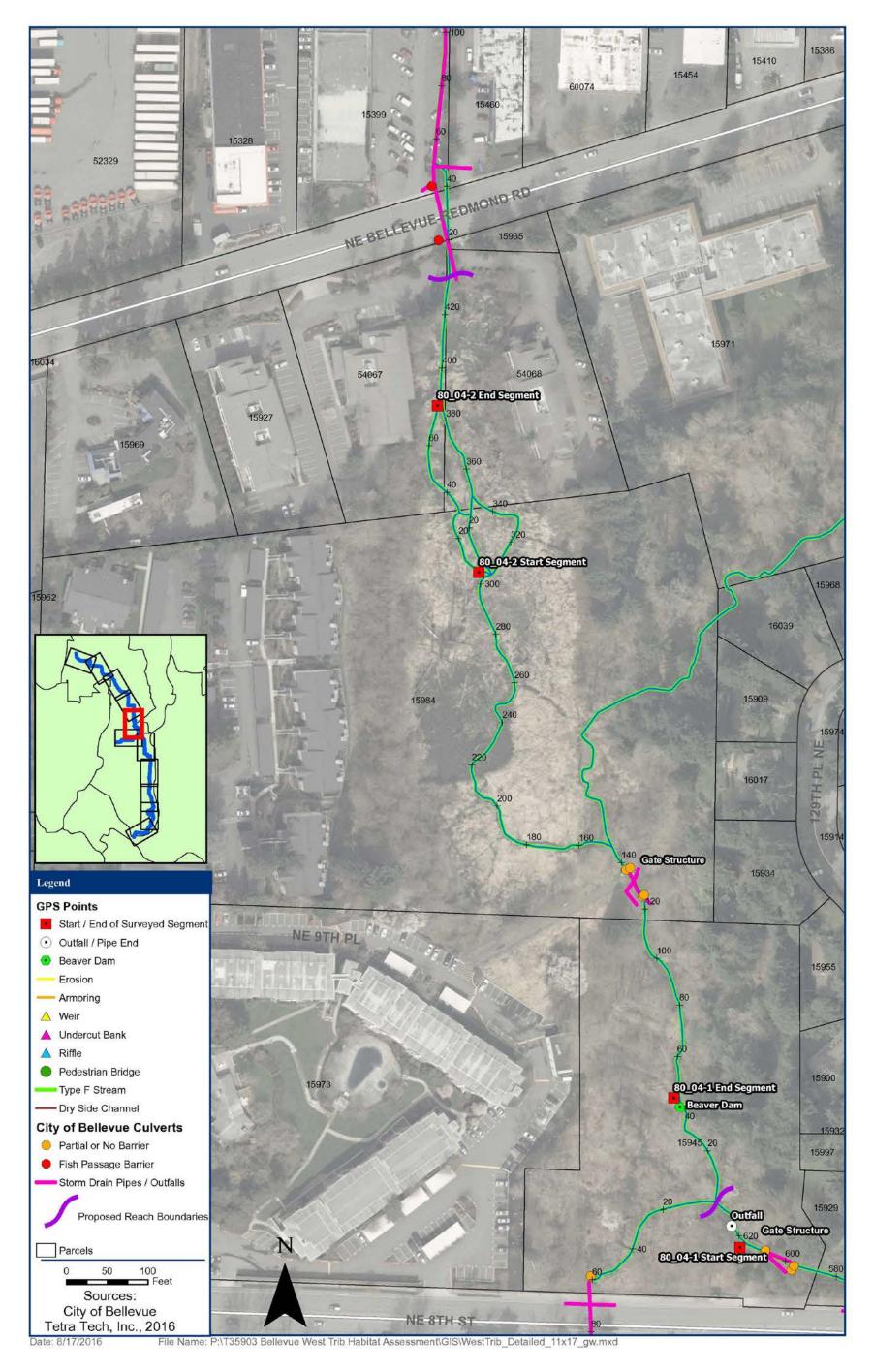


Figure 8. Detailed Reach Segment and Features Map 7 of 11

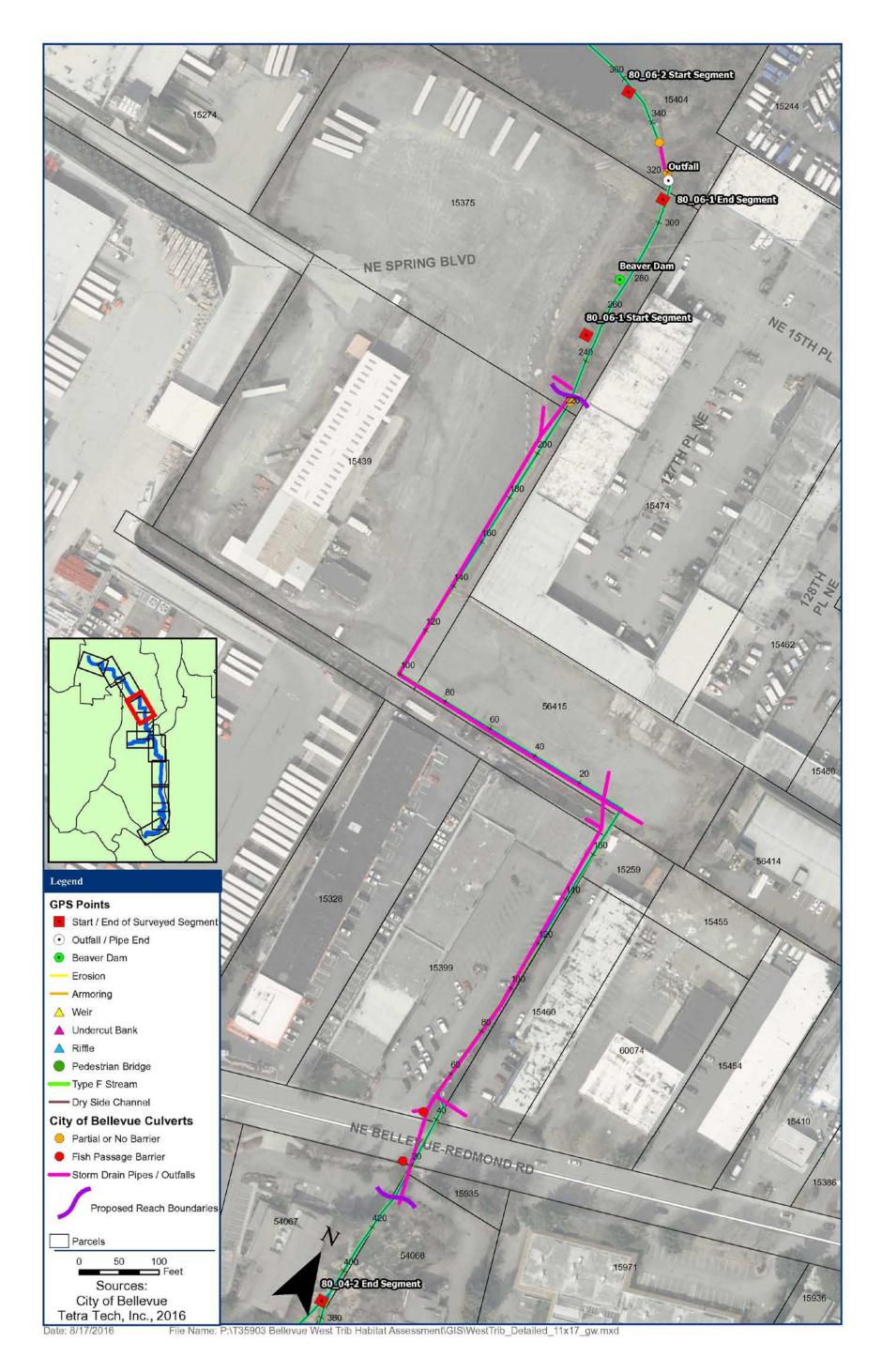


Figure 9. Detailed Reach Segment and Features Map 8 of 11

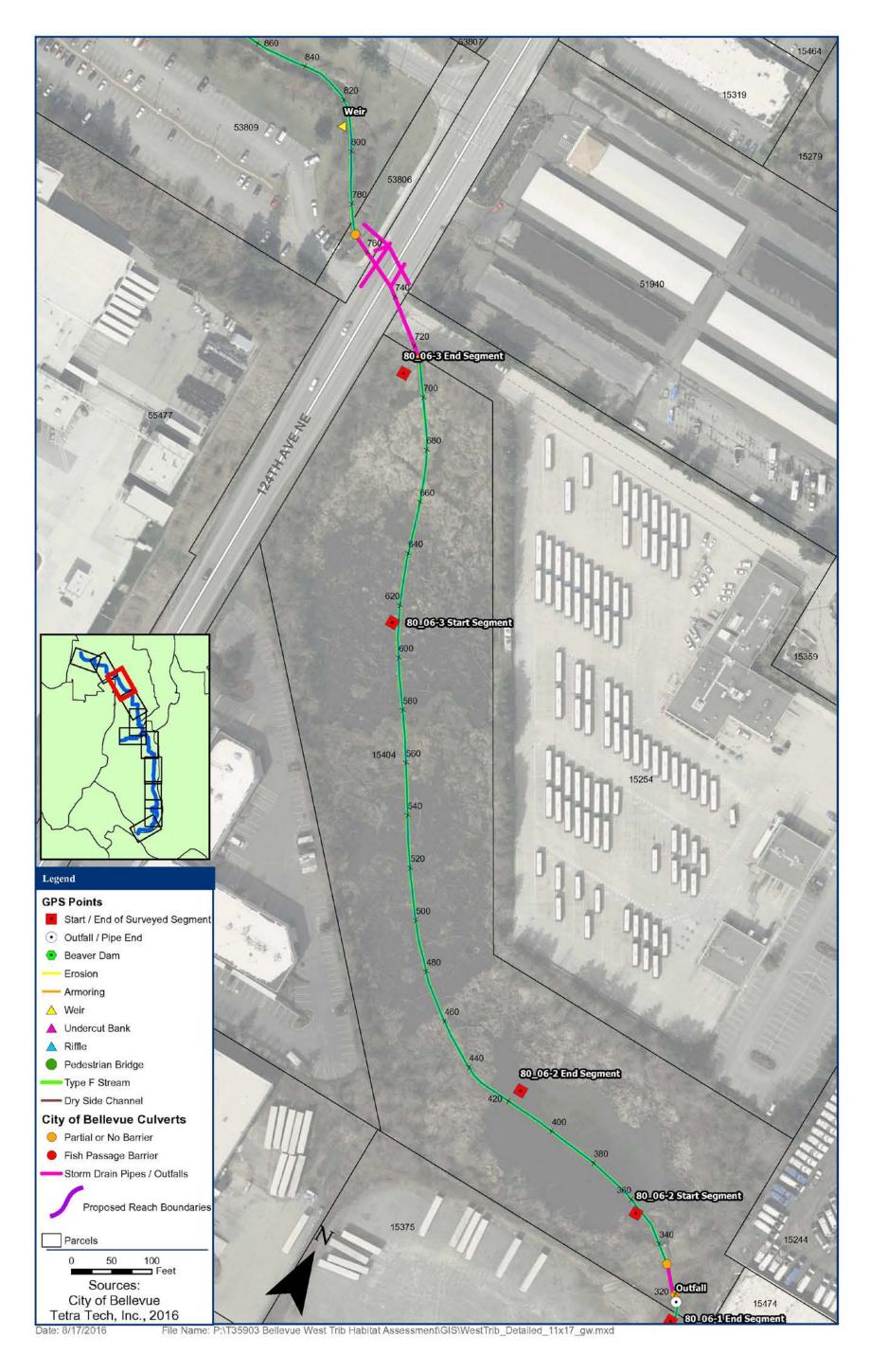


Figure 10. Detailed Reach Segment and Features Map 9 of 11

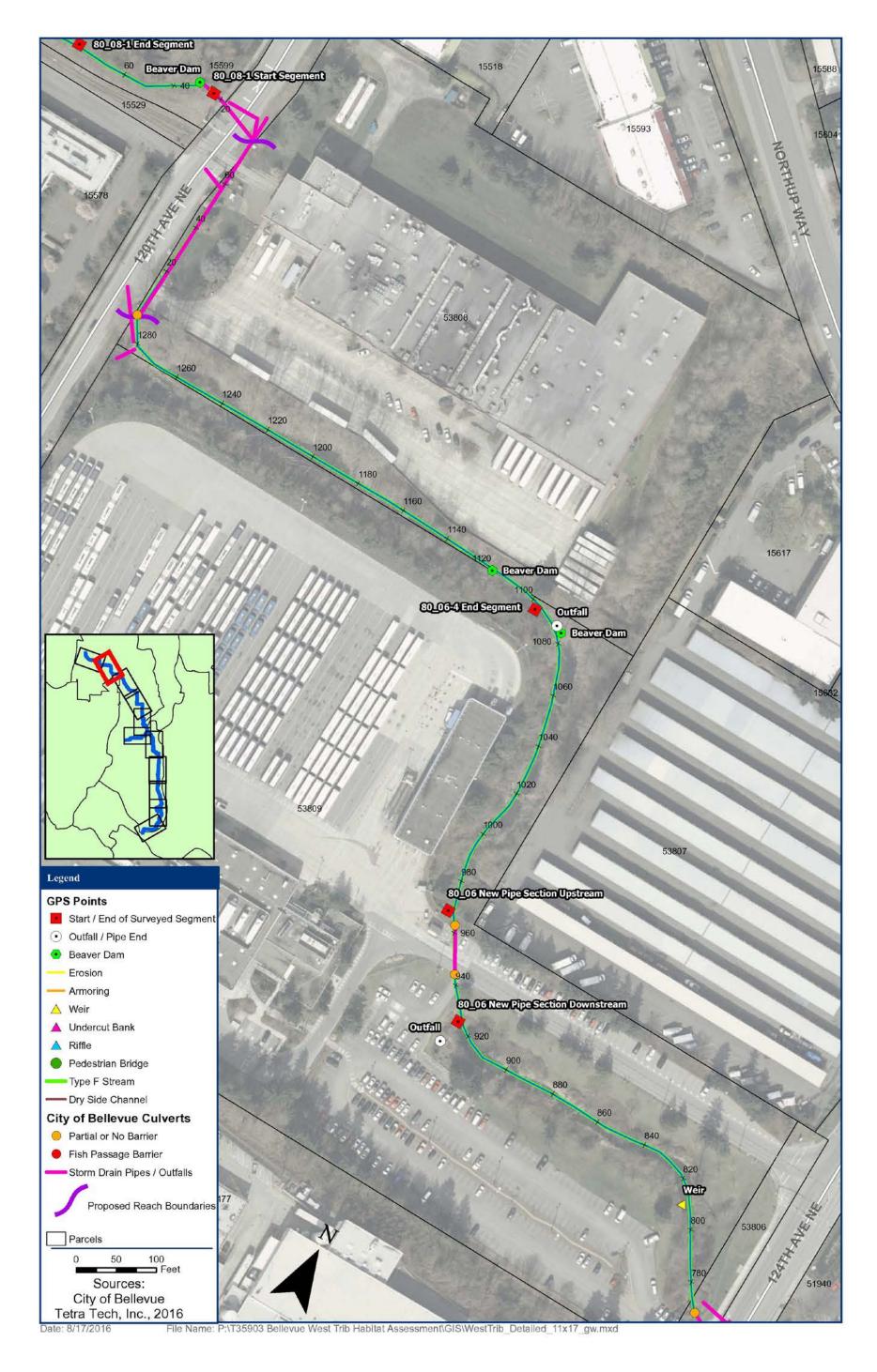


Figure 11. Detailed Reach Segment and Features Map 10 of 11

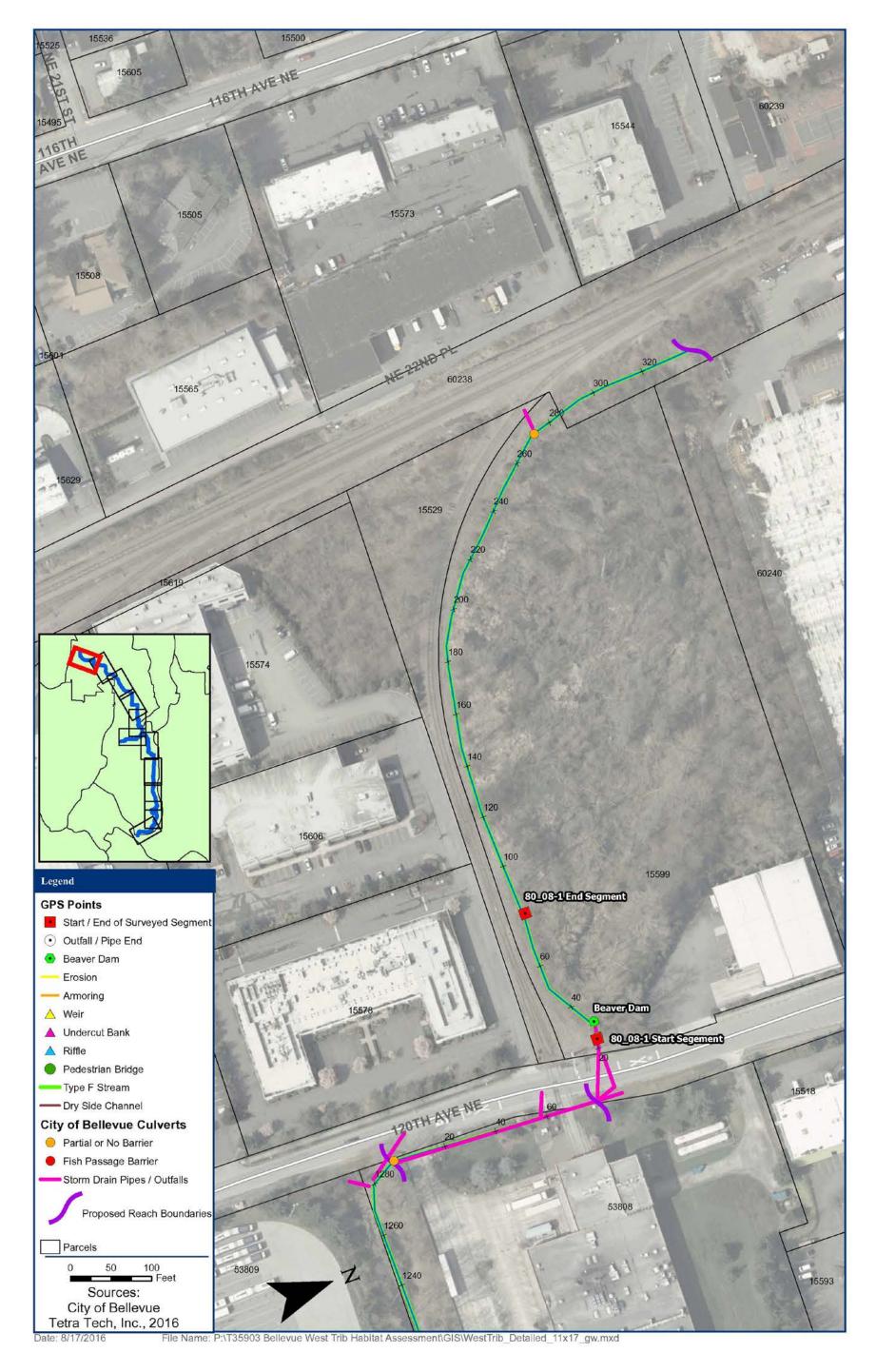


Figure 12. Detailed Reach Segment and Features Map 11 of 11

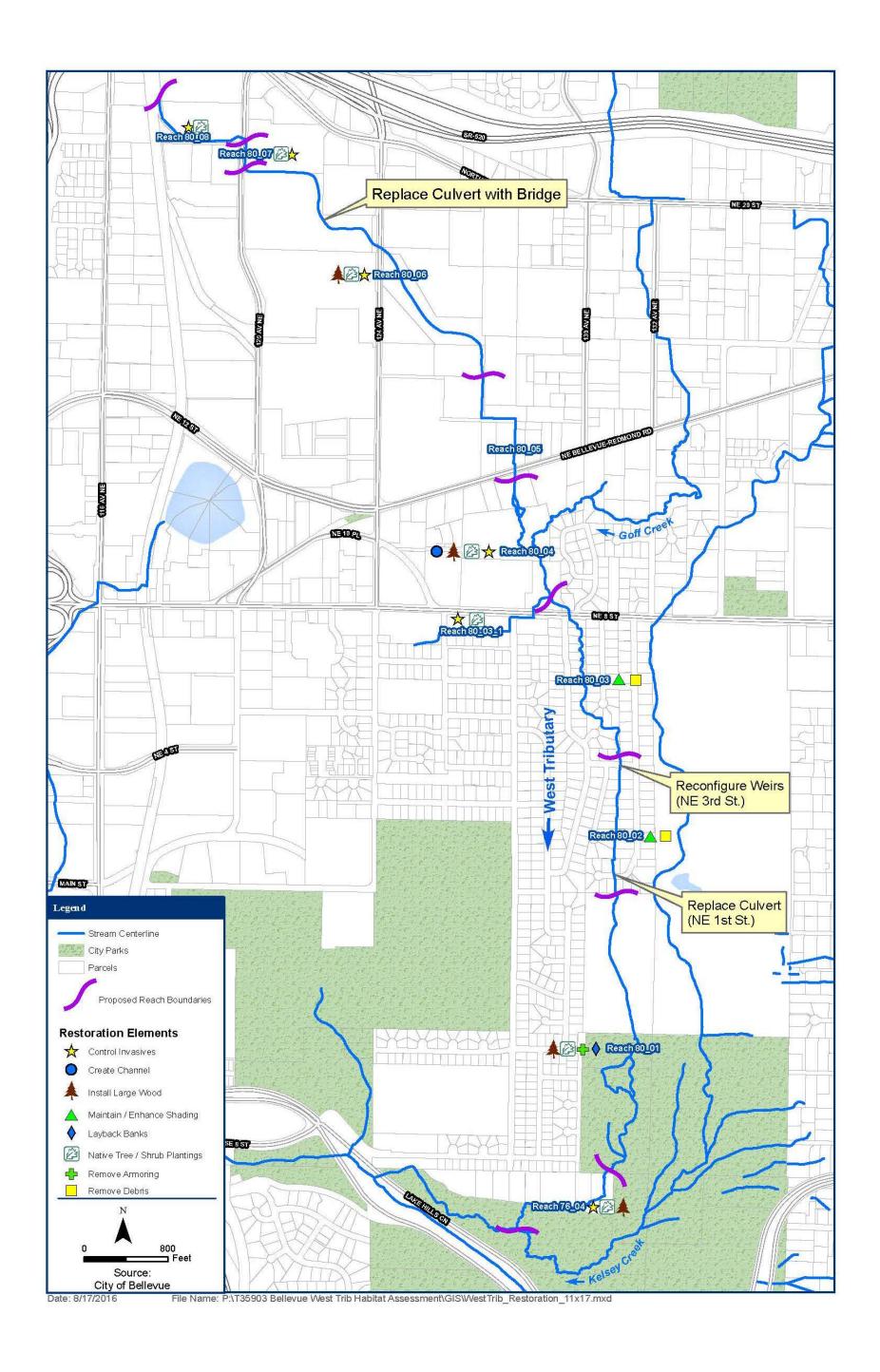


Figure 13. Proposed Restoration Measures Map

APPENDIX A – PDF DATA SHEETS (EXCEL DATA SHEETS PROVIDED ELECTRONICALLY)

APPENDIX B – REPRESENTATIVE PHOTOS BY REACH

NOTE: Photos below are presented by reach, moving from downstream to upstream. Photos are representative of conditions at each reach, not all photos are shown here. Photos have been imported to GIS and are provided electronically.

Reach 76_04

Reach76_04-1 Beaver Pond Left Bank



Reach 76_04-2 Glide Habitat Unit



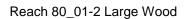
Reach 76_04-1 Beaver Pond



Reach 76_04-2 Glide Habitat Unit



Reach 80_01-1 Glide Habitat Unit





Reach 80_01 Golf Course Glide Habitat Unit



Reach 80_01 Golf Course Bank Erosion





Reach 80_02-1 Riffle and Armoring in Residential Area



Reach 80_02-2 Overgrown Bamboo Over Riffle



Reach 80_02 Armoring and Fence in Residential Area



Reach 80_02 Culvert at NE 3rd Street



Reach 80_03 Drop Structure in Residential Area



Reach 80_03-2 Glide Habitat Unit



Reach 80_03-2 Low Bridge and Armoring



Reach 80_03 Culvert at NE 8th Street



Reach 80_03_01-Trib

Reach 80_03_01 Culvert Emerging from NE 8th Street



Reach 80_03_01-2 Collapsed Culvert at 126th Ave NE



Reach 80_03_01 Trib Beneath Blackberry



Reach 80_03_01-2 Uppermost Reach of Trib



Reach 80_04 Gate Structure North of NE 8th Street



Reach 80_04 Beaver Dam



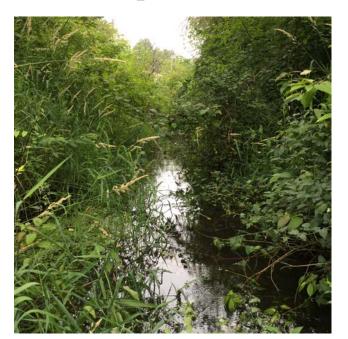
Reach 80_04 Culverts Downstream of Gate Structure



Reach 80_04-2 Reed Canary grass Obscures Stream



Reach 80_06-4 Glide Habitat Unit



Reach 80_06-2 Wood and Cattails in Detention Basin



Reach 80_06-2 Channel in Detention Basin



Reach 80_06 Culvert Outlet at 124th Ave NE



Reach 80_08 Culvert at 120th Ave NE

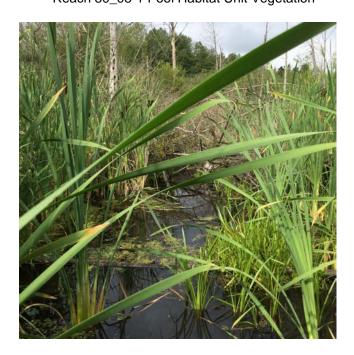




Reach 80_08-1 Pool Habitat Unit Vegetation



Reach 80_08-1 Left Bank Vegetation





APPENDIX C - WOLMAN PEBBLE COUNTS

Wolman pebble counts (WPC) were conducted at West Tributary in the City of Bellevue to provide an assessment of substrate size classes. Data sheets are attached at the end of this Appendix. The procedure is appropriate to determine spawning substrate availability in salmon bearing streams. There were a total of four reaches with potential spawning substrate, including riffles primarily comprised of gravels, including 80_01, 80_02, 80_03, and 80_04 (Table 1). WPCs were not done on the other reaches as they were dominated with fines.

For each of these reaches, WPCs were conducted in one or more representative riffles, for a total of 7 pebble counts (Table 1). At all WPC sites, visual estimation of fines was also made for comparison. Total size class distribution for each of these sites is reported in the attached WPC data sheets, along with percent of each size class in Table 1, and cumulative particle size distribution graphs in Figure 1. Total measurements taken and transects walked are reported in the attached data sheets.

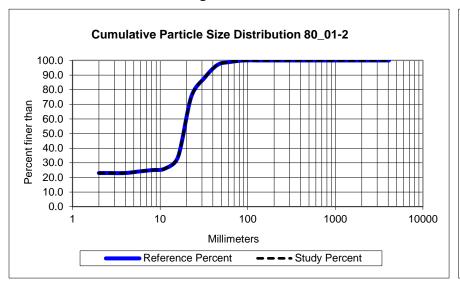
Reach 80_01. Within this reach, there were two suitable spawning substrate areas, located within segments 2 and 3. Dominant particle size classes within the reach included gravels, then fines, then cobbles. Within reach segment 80_01-2 , 74% of all particles selected during the WPC were gravel, followed by 23% fines, and 3% cobble. Fines were estimated at 30% through visual estimation. Reach segment 80_01-3 had 77% gravel, 21% fines, and 1% cobble. Fines were visually estimated at 20%. Bed roughness is estimated as n = (0.28+0.02+0.0+0.005+0.05)1.0 = 0.36.

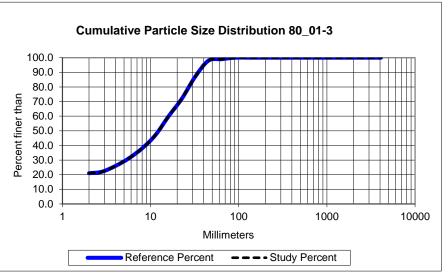
Reach 80_02. In this reach, there were two riffles with potential spawning substrate. Reach segment 80_02-1 substrate size classes were primarily gravels at 71.1%. Fines made up 15.8% and cobbles comprised 13.1%. In comparison, visual estimates of fines was 30%. Reach segment 80_02-2 had mostly gravel at 55%, a larger percentage of cobbles at 22%, boulders present at 20% and only 3% fines. In this case, visual estimation of fines was much higher than the WPC outcome, at 20%. The greater visual estimation of fines is most likely the result of the length of the riffle. The overall fines percent for the entire 60-meter habitat unit (HU1) was estimated, while the WPC was conducted in only one portion of that segment. Bed roughness is estimated as n = (0.30+0.02+0.0+0.01+0.05) 1.0 = 0.38 in the lower section and n = (0.40+0.02+0.0+0.02+0.1) 1.0 = 0.54 in the upper section (more boulder debris and dense bamboo).

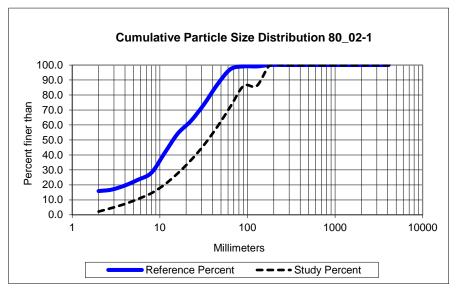
Table 1. Visual and Wolman pebble count results for substrate size class percentages.

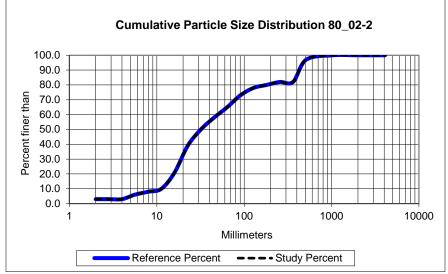
Segment	HU	Visual Estimate of Fines	Boulder	Gravel	Cobble	Fines	HQM Value
80_01-2	4	30	0	74	3	23	Poor
80_01-3	1	20	0	77	1	21	Poor
80_02-1	5	30	0	71.1	13.1	15.8	Good to Excellent
80_02-2	1	20	20	55	22	3	Good to Excellent
80_03-1	3	25	1	77	10	12	Good to Excellent
80_03-2	1	20	<1	74.9	6.1	18.1	Fair
80_04-1	1	50	0	67	1	32	No Value

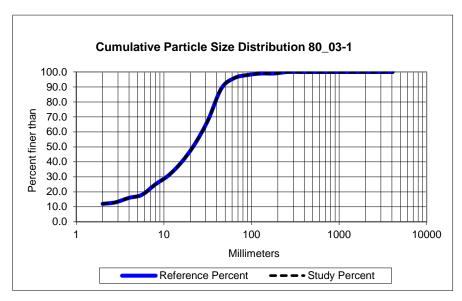
Figure 1. Cumulative Particle Size Distribution for Each Wolman pebble count Site

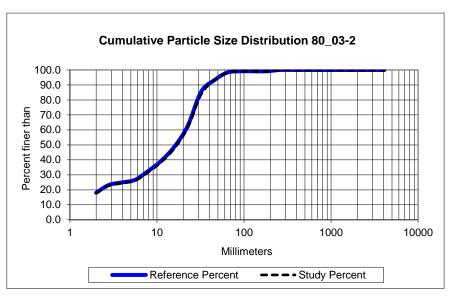


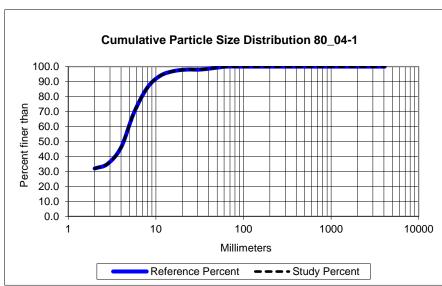












Reach 80_03. Pebble counts in segment 80_03-1 resulted in a total of 77% gravel, 12% fines, 10% cobble and 1% boulders. Visual estimation placed fines at 25%. Segment 80_03-2 had 74.9% gravel, 18.1% fines, 6.1% cobbles, and <1% boulders. Visual estimation for this site was 20% fines. Bed roughness is estimated as n = (0.28+0.02+0.0+0.01+0.05)1.00 = 0.36.

Reach 80_04. At this site only one segment had a suitable riffle for a pebble count at 80_04-1 . Total gravel was 67%, fines were 32%, and cobble was 1%. Visual estimation placed fines at 50%. Bed roughness is estimated as n = (0.28+0.01+0.002+0.04+0.05)1.0 = 0.38.

In cases where the visual estimation of fines was larger than the WPC percent of fines, it is most likely the result of two factors: 1) the presence of larger particles covering the fines, so fines are not selected in a pebble count; and 2) a significant difference in the area that is being evaluated. For visual estimation, the percent of fines is estimated for the entire segment. For the WPC, the area is typically only one riffle habitat unit. The visual estimation then provides an overall evaluation of the spawning substrate condition, while the WPC represents the channel bed roughness.

In Table 1, WPC fines are shown to range from 3% to 23%. These results indicate the best possible spawning habitat potential within the associated stream segment. Visual estimations for the entire reach are higher, ranging from 20-50%. The Habitat Quality Modifier (HQM) for spawning habitat criteria, which is to be used to determine the Priority Index (PI) for restoring fish bearing streams, results in No Value at sites with fines >26%. HQM is poor at sites where fines are 21-26%, and fair when comprising 16-21% of substrate. WPC results indicate that there are at least three spawning habitats of good to excellent quality and one fair quality site in the West Tributary.

Appendix F
Cultural Resources Screening for Bellevue Base
TDC Network and Routers (1124429)

Cultural Resources Screening for Bellevue Base TDC Network and Routers (1124429)

Project Description

This project consists of the installation of new network and routers at the Bellevue Base in Bellevue. Ground disturbance will consist of trenching and/or directional borings for installing new conduit of up to 3 feet deep. This screening utilized both the DAHP WISAARD database and the King County CRPP database. No state or federal funds or federal permits are anticipated for this project.

Cultural Resources in the Project Vicinity

There are no recorded, reported or suspected cultural resources in the project vicinity.

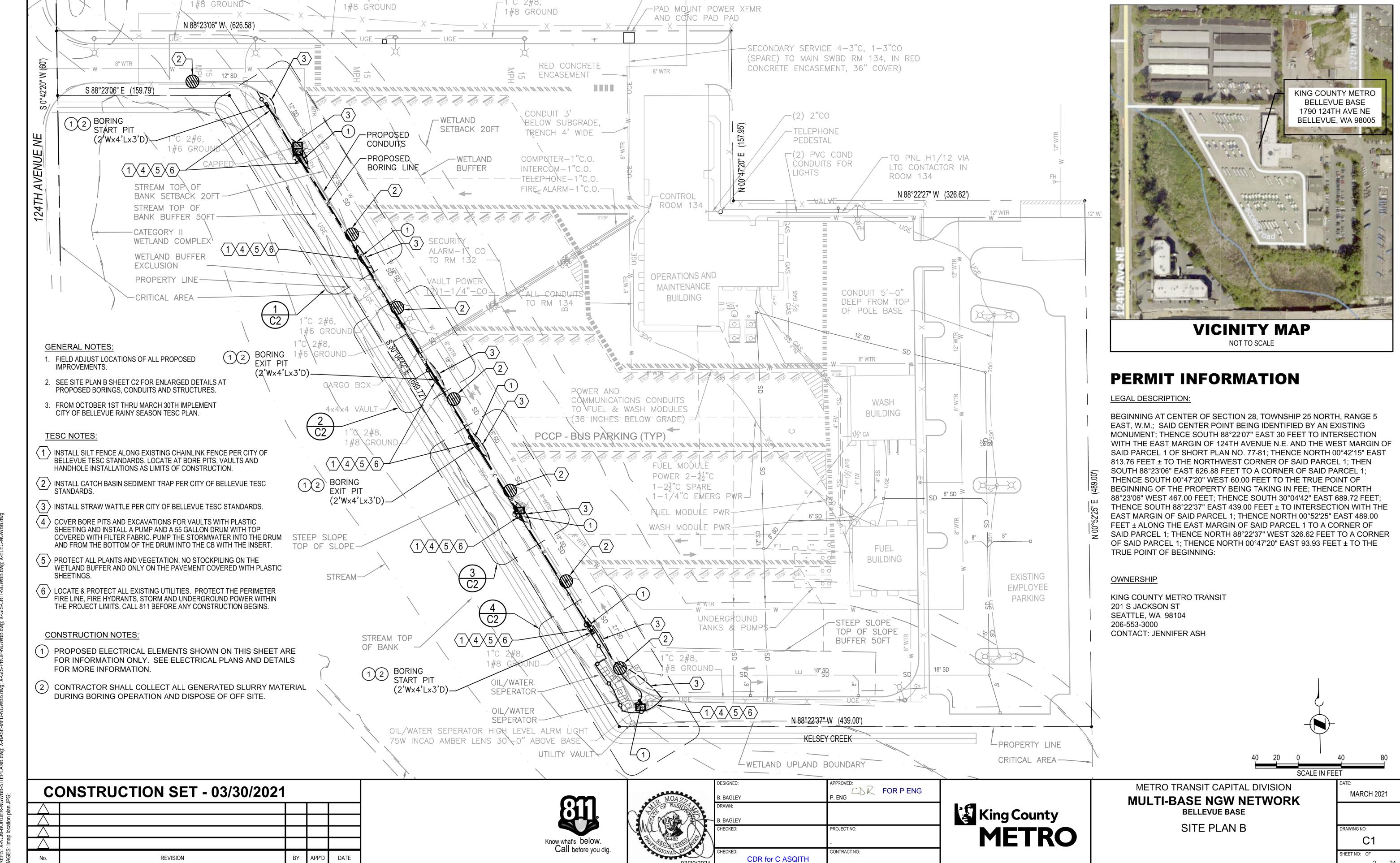
Cultural Resources within ½ Mile of the Project

KING 7308 is the ethnographic placename *Te3u* for Northrup Creek. Waterman (1922:191) provides no translation for this name. 45-KI-854 is the Midlakes Pioneer Cemetery. The cemetery included numerous Japanese families. It was reportedly moved in 1970, although not all of the graves have been confirmed. There are no other recorded, reported or suspected cultural resources within ½ mile of the project.

Recommendations

The general setting of the project on an existing graded and paved roadway and within existing buildings with no recorded, reported or suspected sites in the vicinity suggests a low likelihood for buried intact prehistoric archaeological deposits. The project is not within a historic district. It is recommended that no further cultural resources review be needed for this project. In accordance with State Law, if any suspected human remains or archaeological deposits are encountered during construction, then all activities will cease in that area while county policies are complied with.

Screened by Tom Minichillo, PhD, January 6, 2021.

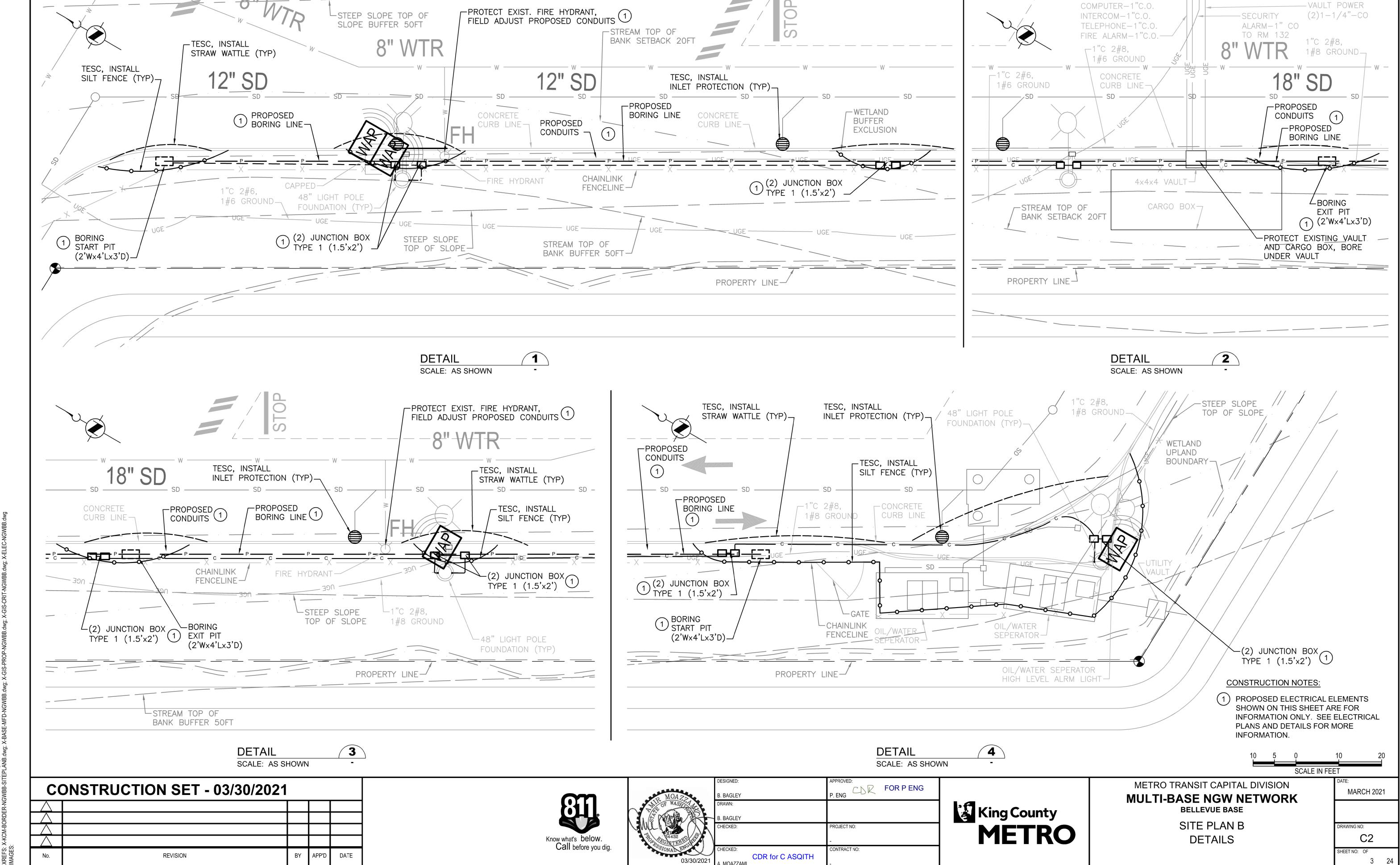


MOAZZAMI

-1200A, 4801/277V, 3ø 4W SERVICE

_1"C 2#8,

-1"C 2#8,



. MOAZZAMI

V:\Projects\Transit Properties\Operations Bases\N PLOTTED: Mar 31, 2021-08:28:52am By bagleyt XREFS: X-KCM-BORDER-NGWBB-SITEPLANB IMAGES:

KING COUNTY METRO BELLEVUE BASE NEXT GENERATION WIRELESS (NGW) PROJECT

WETLAND DELINEATION AND CRITICAL AREA REPORT

PREPARED FOR:

King County Metro 201 South Jackson Street Seattle, WA 98104 Contact: John Greene 206.263.0506

PREPARED BY:

ICF 1200 6th Avenue, Suite 1800 Seattle, WA 98101 Contact: Ingrid Kimball, PWS 206.801.2832

May 2021



Contents

		Page
Tables and Fig	gures	iii
Acronyms and	d Abbreviations	iv
Chapter 1 Int	roduction	1-1
1.1	Background	
1.2	Project Description	1-1
Chapter 2 Rea	gulatory Framework	2-1
2.1	Local Regulations	
2.1.1		
2.2	State Regulations	2-2
2.3	Federal Regulations	2-2
2.3.1	Determination of Potentially Jurisdictional Ditches	2-2
Chapter 3 Me	ethods	3-1
3.1	Desktop Analysis	3-1
3.2	Fieldwork	3-1
3.2.1	Hydrology	3-2
3.2.2	Soils	3-2
3.2.3	Hydrophytic Vegetation	3-3
3.2.4	Determination of Wetland Classifications	3-3
3.2.5	Wetland Functional Assessment	3-3
Chapter 4 Res	sults	4-1
4.1	Existing Conditions	4-1
4.1.1	Project Setting	4-1
4.1.2	Critical Area Study Extent	4-1
4.2	Desktop Assessment Results	4-1
4.2.1	U.S. Geological Survey Topographic Map	4-1
4.2.2	Hydrology	4-4
4.2.3	Natural Resources Conservation Soil Survey	4-4
4.2.4	Steep Slopes	4-4
4.2.5	Wetland and Stream Inventories	4-5
4.2.6	Fish and Wildlife Habitat	4-5
4.3	Wetland and Stream Delineation Results	4-8
4.3.1	Wetland Complex BB1, PSS1C, and PABH (5.63 acres)	4-8

i

4.3.2	Wetland Unit BB2, PFO1C (0.02 acre)	4-11	
4.3.3	West Tributary to Kelsey Creek (922 linear feet)	4-13	
4.4	Limitations	4-16	
Chapter 5 Imp	pacts and Mitigation Assessment	5-1	
5.1	Temporary Impacts		
5.2	Permanent Impacts		
5.2.1	New Permanent Structures	5-6	
5.2.2	Cumulative Impacts	5-7	
5.2.3	Impacts on Critical Area Buffers and Setbacks	5-7	
5.3	Mitigation Measures	5-10	
5.3.1	Avoidance	5-10	
5.3.2	Minimization	5-10	
5.3.3	Available Mitigation Measures	5-11	
Chapter 6 Ref	erences	6-1	
Appendix A	Construction Set		
Appendix B	Agency Online Mapping Resources		
Appendix C	U.S. Army Corps of Engineers Wetland Delineation Data Forms		
Appendix D	Washington State Department of Ecology OHWM Determination Forms		
Appendix E	Washington State Department of Ecology Wetland Rating Forms		
Appendix F	WETS Tables		
Appendix G Photo Log			
Appendix H	Study Area Plant List		
Appendix I	The Riley Group Geotechnical Report		

Tables and Figures

Table	Page
Table 1. Wetland Critical Area Buffers and Structural Setbacks	2-1
Table 2. Plant Species Indicator Category Definitions	3-3
Figure	Page
Figure 1. Bellevue Base Project Vicinity	4-2
Figure 2. Bellevue Base Project Site and Adjacent Critical Areas	4-3
Figure 3. Steep Slopes and Associated Buffers and Setbacks	4-7
Figure 4. West Tributary OHWM Determination, Wetland Delineation, and Sample Plots	4-9
Figure 5. Wetland and Associated Buffers and Setbacks	4-14
Figure 6. West Tributary to Kelsey Creek and Associated Buffers and Structural Setbacks	4-15
Figure 7. Temporary Impacts during Construction (With Buffer and Setback Exclusions)	5-3
Figure 8. Permanent Impacts (With Buffer and Setback Exclusions)	5-5
Figure 9. Temporary Impacts during Construction (No Buffer and Setback Exclusions)	5-8
Figure 10 Permanent Impacts (No Buffer and Sethack Exclusions)	5-9

Acronyms and Abbreviations

bgs below ground surface

Corps U.S. Army Corps of Engineers

CWA Clean Water Act

DNR Washington State Department of Natural Resources

Ecology Washington State Department of Ecology EPA U.S. Environmental Protection Agency

FAC facultative

FACU facultative upland FACW facultative wet FR Federal Register

GHz gigahertz

GMA Growth Management Act
GPS global positioning system
HDPE high-density polyethylene

HGM hydrogeomorphic HUC hydrologic unit code

King County Metro King County Metro Transit

LUC land use code

NRCS Natural Resources Conservation Service

NWI National Wetlands Inventory

OBL obligate

OHWM ordinary high water mark

project Bellevue Base Next Generation Wireless Installation Project

RCW Revised Code of Washington

Regional Supplement Regional Supplement to the Corps of Engineers Wetland Delineation

Manual: Western Mountains, Valleys, and Coast Region

SEPA State Environmental Policy Act

SWPPP Stormwater Pollution Prevention Plan TESC temporary erosion sediment control

UPL upland

U.S.C. United States Code

USFWS U.S. Fish and Wildlife Service

USGS U.S. Geological Survey

WAC Washington Administrative Code

WAP wireless access point

WDFW Washington Department of Fish and Wildlife

WRIA Water Resource Inventory Area

1.1 Background

King County Metro Transit (King County Metro) is proposing the Bellevue Base Next Generation Wireless (NGW) Project (project) at Bellevue Base to improve bus computer connectivity and communication with King County Metro operations office systems throughout the bus yard. In accordance with City of Bellevue Land Use Code (LUC) 20.25H.005, the presence or absence of critical areas, such as wetland, streams, steep slopes, and wildlife habitat, must be determined within a project site. ICF is supporting King County Metro to determine the location of critical areas and associated buffers, possible impacts from the project, and feasible mitigation measures if required.

1.2 Project Description

In 2009, King County Metro installed a Cisco 4.9 gigahertz (GHz) wireless network as part of its On-Board System Communication Center System, which allows bus computers to transmit or upload daily data, such as passenger counts, fare transactions, ORCA card reloads, fare tables, on-board schedules, stop announcements, and other on-board data configuration. In 2018, Cisco discontinued support of this hardware. The goal of this project is to upgrade the current 4.9 GHz network to a 5 GHz wireless network using new Cisco wireless access points (WAPs) mounted on light poles or exterior building walls. This upgrade would allow and improve communication between bus and operations office computer systems for data integration. Project construction and operation would occur within the 367,180-square-foot area of Bellevue Base, in the bus yard portion of Bellevue Base (project site). The bus base at the project site was originally established in 1983 and contains an employee parking lot, a bus parking area, a vehicle maintenance and operations building, a fuel building, and a wash building. A tributary to Kelsey Creek (West Tributary) runs northwest to southeast along the western and southern boundaries of the project site along with an associated freshwater emergent wetland complex.

Twelve new Cisco WAPs would be installed throughout Bellevue Base: four mounted on floodlight poles along the western boundary, six on the exterior of the operations and maintenance building, and two on the western corners of the fuel building. Of the six WAPs on the operations and maintenance building, four directional WAPs would be mounted on the western exterior wall, and two omni-directional WAPs would be installed in the southeast corner and above the roof tool box cage. WAPs mounted on floodlight poles and the fuel building would be directional. WAPs would be between 10 and 16 feet high, as measured from the bottom of the antenna.

New conduit, conduit supports, and junction boxes would be installed to route power to the WAPs mounted on floodlight poles. Conduit installation of two 2-inch schedule 80 high-density polyethylene (HDPE) communication and two 2-inch schedule 80 HDPE power would be installed at a minimum of 24 to 36 inches below grade. Existing conduits, running from the operations and maintenance building to a southwest vault, would be utilized to avoid trenching or boring beneath the bus yard parking area. Directional boring along the western boundary would be utilized to

King County Metro Introduction

minimize ground disturbance by installing up to four soil pits during construction. Twelve Type 1 inground metal junction boxes would be installed along the western boundary. Four new aboveground cast metal junction boxes would be attached to conduit supports and an existing light pole, where AP8 would also be attached, at the southwest corner of Bellevue Base. All junction boxes would be paired: one to be used for communication and the other for electrical power. Eleven new conduit supports would be installed to accommodate and connect conduits to the four new aboveground junction boxes (Appendix A, *Construction Set*). Most areas of ground disturbance would be within 5 feet of the perimeter curb. At a minimum, approximately 161.5 square feet of ground surface area and approximately 656.75 cubic feet of soil/ground materials would be disturbed to install new conduits, conduit supports, and junction boxes, including excavation for the following.

- 1. Four entry and exit soil pits for directional boring, measuring approximately 6 feet long by 3 feet wide by 3 feet deep.
- 2. Directional boring, between 24 and 36 inches below grade, along the western boundary.
- 3. One trench, measuring approximately 54 feet long by 8 inches wide by 24 inches deep, running from the southwest vault to the nearest Type 1 junction boxes to the northwest, and to an exit boring pit to the southeast. This trenching would be completed on top of the planned directional boring.
- 4. Four trenches, measuring 5 feet long by 0.8 feet wide by 2 feet deep, running from Type 1 junction boxes to two light pole foundations (light pole supporting AP10 and AP11 and light pole supporting AP9).
- 5. Twelve Type 1 junction boxes, measuring 22 inches long by 17 inches wide by 12 inches deep.
- 6. Eleven conduit supports, measuring 6 inches long by 12 inches wide by 6 inches deep.

Surface disturbance would take place within areas dominated by weedy species, such as blackberries (*Rubus armeniacus*), St. John's wort (*Hypericum perforatum*), perennial grasses, English ivy (*Hedera helix*), and bare ground along the boundaries. Grade or elevation would be restored to match existing conditions. To reduce overall ground disturbance along the western boundary and increase construction efficiency, conduits and junction boxes for the Bellevue Base Yard Lighting Replacement Project, would be installed concurrently within the project site.

Upon completion of the project, the Bellevue Base wireless system would provide improved communication and data transfer between buses and King County Metro operations.

2.1 Local Regulations

The Washington State Growth Management Act (GMA) of 1990 requires that comprehensive growth plans be developed by counties and cities with state oversight. The GMA specifically lists five "critical areas" for which local governments must designate and develop protection and enhancement programs. These five areas are fish and wildlife habitat, wetland, aquifer recharge areas, flood hazard areas, and geological hazard areas. In the City of Bellevue's Critical Area Ordinance and Land Use Code, these areas include Streams and Riparian Areas (LUC 20.25H.075), Wetlands (LUC 20.25H.095), Habitats for Species of Local Importance (LUC 20.25H.150), Frequently Flooded Areas (LUC 20.25H.175), and Geological Hazard Areas (LUC 20.25H.120). Projects that would be within these critical areas or associated buffers and structural setbacks are required to complete a critical area report and Washington State Environmental Policy Act (SEPA) checklist as part of obtaining a City of Bellevue Critical Areas Land Use permit (City of Bellevue 2019).

2.1.1 Buffers and Structural Setbacks

Associated critical area buffers and structural setbacks are described in LUC 20.25H.035 and summarized in Table 1 below. Wetland buffers and setbacks are determined through the Washington State Department of Ecology (Ecology) wetland rating system's overall category and habitat score, unless they are already included in an established Native Growth Protection Areas or Native Growth Protection Easements plan. If a wetland buffer or structural setback extends into a primary structure established prior to August 1, 2006, this buffer or structural setback shall be modified to exclude the structure (LUC 20.25H.095.D.1.b).¹

Table 1. Wetland Critical Area Buffers and Structural Setbacks

Wetland Category	Habitat Score	Buffer (feet)	Structural Setback (feet)
I	8-9	225	20
	5-7	110	
	3-4	75	
II	8-9	225	20
	5-7	110	
	3-4	75	
III	8-9	225	15
	5-7	110	
	3-4	60	
IV	All	40	None

¹ The classification of legal nonconforming primary structure, subject to City of Bellevue's interpretation, could be applicable to the Bellevue Base, and the project could be exempt from wetland buffer and setback requirements, as the entire Bellevue Base was established well before August 1, 2006.

King County Metro Regulatory Framework

Stream buffers and structural setbacks are typically determined through Washington State Department of Natural Resources (DNR) stream type (LUC 20.25H.075.B). However, per City of Bellevue ordinance, streams within the Kelsey Creek basin have specific buffer and setback ordinances. As such, the entire reach of the West Tributary, Kelsey Creek basin is required to have a 50-foot buffer and additional 20-foot setback from the top of bank (LUC 20.25H.075.C.1.c and LUC 20.25H.075.D.2.c). *Top of bank* is defined by the City of Bellevue as an area 50 feet out beyond a break that is flatter than 3:1 (LUC 20.50.048).

Steep slope buffers and structural setbacks are determined from the top or toe of slope. From the toe of slope, the City of Bellevue requires a 75-foot setback with no mandatory buffer (LUC 20.25H.120.C.2.b); at the top of slope, a 50-foot buffer with no mandatory structural setback is required (LUC 20.25H.120.B.1.b). As previously stated, if a steep slope buffer or structural setback extends into a primary structure established prior to August 1, 2006, this buffer or structural setback shall be modified to exclude the structure (LUC 20.25H.120.B.2).

2.2 State Regulations

Ecology requires and regulates permits for discharges into state waters and wetland under the state Water Pollution Control Act and federal Clean Water Act (CWA) Water Quality Certification (Section 401). Ecology has authority under the Water Pollution Control Act to regulate any change in the physical, biological, or chemical properties of any waters of Washington (Revised Code of Washington [RCW] 90.48.020). Additionally, under the Washington State Hydraulic Code, a Hydraulic Project Approval is required from the Washington Department of Fish and Wildlife (WDFW) for any changes to a wetland or stream that may affect hydrology downstream (Washington Administrative Code [WAC] Chapter 220-660). The Hydraulic Project Approval typically also requires a SEPA determination from the local government to analyze current conditions and possible impacts from a proposed project (RCW Chapter 43.21C). If project work does not result in discharge into state waters and wetland or change to downstream hydrology during project construction or operation, these permits would not be required.

2.3 Federal Regulations

Any project or development that discharges dredged and fill material into a water of the United States is required to obtain a nationwide or individual permit from the U.S. Army Corps of Engineers (Corps) (33 United States Code [U.S.C.] Section 1251 et seq.; CWA Section 404). If project work does not result in discharge or fill into waters of the United States during project construction or operation, this permit would not be required. As no navigable waterway is within the King County Metro Bellevue Base, any streams or wetland identified during the delineation would not be regulated under Section 10 of the Rivers and Harbors Act.

2.3.1 Determination of Potentially Jurisdictional Ditches

Jurisdictional ditches have the potential to provide functions such as water quality treatment, sediment removal, and stormwater conveyance. In the past, ditches could be regulated by the Corps if they met criteria demonstrating they have a direct and significant connection to a regulated water of the United States. However, as of June 20, 2020, the Navigable Waters Protection Rule (84 *Federal*

King County Metro Regulatory Framework

Register [FR] 56626) became final, removing potentially jurisdictional ditches from being considered a water of the United States. A brief history of the determination of potentially jurisdictional ditches is provided here.

In June 2007, the Corps issued Regulatory Guidance Letter No. 07-01 on the Practices for Documenting Jurisdiction under Sections 9 and 10 of the Rivers and Harbors Act of 1899 and Section 404 of the CWA (Corps 2007). This letter was in response to the June 19, 2006, ruling by the U.S. Supreme Court on *Rapanos v. United States*, 547 U.S. 715 (2006), which did not clarify the definition of a jurisdictional "water of the United States." On June 29, 2015, the U.S. Environmental Protection Agency (EPA) published the Clean Water Rule (80 FR 37054, June 29, 2015). The final rule became effective on August 28, 2015 but was subsequently stayed (not enacted) nationwide as of October 9, 2015, by the U.S. Court of Appeals for the Sixth Circuit. On December 23, 2019, the EPA repealed the 2015 Clean Water Rule as "Step One" in a two-step process to streamline and unify what is defined as a water of the United States across federal and state agencies under the Navigable Waters Protection Rule (84 FR 56626). Step Two, published April 21, 2020, became final on June 20, 2020. Per the final rule, ditches, groundwater, diffuse stormwater runoff, converted cropland, ephemeral streams—those streams that are only fed through precipitation—and artificial irrigation areas and lakes and ponds are no longer to be considered a water of the United States (85 FR 22250). Consequently, potential jurisdictional ditches no longer need to be considered at a federal level.

3.1 Desktop Analysis

Prior to fieldwork, the potential for critical areas to be present at the project site and adjacent areas was evaluated by conducting a desktop analysis using the following sources. Figures generated from agency websites are provided in Appendix B, Agency Online Mapping Resources.

- Aerial photographs viewed in Google Earth
- City of Bellevue Stream and Critical Areas Map (City of Bellevue 2018a)
- City of Bellevue Geologic Hazards Map (City of Bellevue 2018b)
- Puget Sound Watershed Characterization Project (Washington State Department of Ecology 2019)
- Flood Insurance Rate Map for King County Washington Incorporated Areas, Panel 53033C0368G (Federal Emergency Management Agency 1995)
- King County iMaps (King County 2020)
- Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2019)
- NRCS WETS table (National Water and Climate Center 2020)
- Bellevue Base Expansion Project NEPA Documented Categorical Exclusion (King County Metro 1994).
- West Tributary Habitat Assessment, Final Report (Tetra Tech 2016)
- U.S. Geological Survey (USGS) 7.5-minute series Kirkland quadrangle topographic map (USGS 2017a)
- USGS 7.5-minute series Mercer Island quadrangle topographic map (USGS 2017b)
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) data (USFWS 2019)
- WDFW Priority Habitats and Species: Maps (WDFW 2020a)
- WDFW SalmonScape (WDFW 2020b)
- Washington Natural Heritage Program, rare and imperiled species and plant communities (DNR 2020)

3.2 Fieldwork

The wetland delineation was conducted using the methods outlined in the Corps' 1987 Wetlands Delineation Manual (Environmental Laboratory 1987) and the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Regional Supplement) (Environmental Laboratory 2010). The stream ordinary high water mark

King County Metro Methods

(OHWM) was established within the property boundary per Ecology's *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (Ecology 2016).

ICF collected field data on September 22, 2020; wetland boundaries were documented using the Regional Supplement data forms. Wetland boundaries were identified using sample plots where data on vegetation, soils, and observable hydrology was collected. Eight sample plots were recorded to document wetland and adjacent upland conditions; the data forms are presented in Appendix C, *U.S. Army Corps of Engineers Wetland Delineation Data Forms*, and Appendix D, *Washington State Department of Ecology OHWM Determination Forms*. The associated Wetland Rating Forms are presented in Appendix E, *Washington State Department of Ecology Wetland Rating Forms*. Prior to the field survey, hydrological conditions were reviewed to determine if hydrological conditions could be considered wet, normal, or dry (Appendix F, *WETS Tables*). A photo log of existing conditions along the West Tributary and the southern steep slope is provided in Appendix G, *Photo Log*, and a plant list of vegetation observed during fieldwork is provided in Appendix H, *Study Area Plant List*.

Wetland boundaries and sample plot locations were flagged in the field and recorded using a submeter global positioning system (GPS) unit. Formal sample plot locations were marked in the field using pink flags labeled with the sample identification.

3.2.1 Hydrology

Wetland hydrology is defined as soil inundation or saturation for sufficient duration to develop hydric soils that support vegetation typically adapted for life in periodically anaerobic soil conditions (Environmental Laboratory 1987, 2010). Primary indicators of wetland hydrology include inundation (i.e., standing water), saturation in the upper 12 inches of the soil column, shallow water table (upper 12 inches), water marks or lines on adjacent stationary objects (e.g., trees), sediment deposits or drift lines on vegetation, oxidized rhizospheres along living roots, and water-stained leaves, among others. The presence of two or more secondary hydrology indicators also satisfies the Corps' criteria for evidence of wetland hydrology. Secondary indicators include surface drainage patterns, a dry-season water table, shallow aquitard, saturation on aerial photography, geomorphic position, or facultative (FAC)-neutral test (Environmental Laboratory 2010).

3.2.2 Soils

Hydric soils are defined as soils that are saturated, flooded, or ponded for sufficient duration during the growing season to develop anaerobic (i.e., reducing) conditions in the upper layers (Environmental Laboratory 1987, 2010). Hydric soils were identified in the field by digging soil pits to at least a 16-inch depth, where possible, and examining the soil profile for hydric soil indicators as defined by the National Technical Committee for Hydric Soils (NRCS 2018). A soil may be considered hydric if any one of the following indicators is present.

- More than 50% organic material in the upper horizon.
- Strong sulfidic odor.
- Morphological characteristics that meet specific hydric soil indicators (NRCS 2018; Environmental Laboratory 1987, 2010).

King County Metro Methods

Soil texture, matrix color, and presence of redoximorphic features, depleted matrix, or other relevant hydric soil indicators were recorded on the Regional Supplement field data forms (Appendix C). Soil hue, value, and chroma were determined using the Munsell Soil Color Chart System (Munsell Color Services 2000).

3.2.3 Hydrophytic Vegetation

Hydrophytic vegetation are plants that have adapted a tolerance for prolonged periods of saturation or inundation. Under normal conditions, hydrophytic vegetation is considered present if more than 50% of the dominant species from each stratum—tree, shrub, vine, and herbaceous—are classified as obligate (OBL), facultative wet (FACW), and/or FAC, according to the USFWS publication *The National Wetland Plant List: 2016 Wetland Ratings* (Lichvar et al. 2016). These classifications are based on the likelihood that a certain plant species occurs within a wetland, as shown in Table 2.

Table 2. Plant Species Indicator Category Definitions

Category	Definition
Obligate (OBL)	Plants that almost always occur in wetlands (estimated probability >99%) under natural conditions.
Facultative wet (FACW)	Plants that usually occur in wetlands (estimated probability 67%–99%) but are occasionally found in nonwetland areas.
Facultative (FAC)	Plants that are equally likely to occur in wetlands or nonwetlands (estimated probability 33%–67%).
Facultative upland (FACU)	Plants that usually occur in nonwetlands (estimated probability 67%–99%).
Upland (UPL)	Plants that usually occur in nonwetlands (estimated probability >99%) under natural conditions.

Source: Lichvar et al. 2016.

Plant species were identified using standard taxonomic references (Cooke 1997; Pojar and Mackinnon 2004; Hitchcock and Cronquist 1973). Dominant species were determined by using the 50/20 rule, where dominants are the most abundant species that individually or collectively account for more than 50% of the total coverage of vegetation in the stratum (layer), plus any other species that, by itself, accounts for at least 20% of the total, as shown in the data forms (Appendix C). All plant species encountered at a sample plot are listed in the data forms, which, when taken together, provide a full picture of the vegetation community.

3.2.4 Determination of Wetland Classifications

Cowardin vegetation class and hydrogeomorphic (HGM) class information are required to determine the functions of wetland and to inform mitigation design if unavoidable impacts on wetland are proposed. Cowardin vegetation class was determined based on the USFWS wetland classification system (Cowardin et al. 1979). HGM class was determined in the field using the guiding document *A Hydrogeomorphic Classification for Wetlands* (Brinson 1993).

3.2.5 Wetland Functional Assessment

Wetland was rated according to the guidelines set forth in the *Washington State Wetland Rating System for Western Washington* (Hruby 2014) (Appendix F). The functional assessment is based on

King County Metro Methods

three major groups of functions that wetland performs: water quality improvement, hydrologic functions, and wildlife habitat. Each function is given equal importance in setting the category for a wetland. The ratings for each function are divided into site potential, landscape potential, and value. The rating for each function can be useful in determining how well a wetland performs each function. The functional analysis informs local wetland buffer requirements and mitigation planning so that wetland creation, restoration, or enhancement areas compensate for the functions specific to the affected wetland. As mentioned previously, this rating is often used by local agencies to determine required buffers.

4.1 Existing Conditions

4.1.1 Project Setting

Bellevue Base is located at 1790 124th Avenue NE, Bellevue, WA 98005 (Figure 1). The project site, where construction and operation of the project would occur, is a 367,180-square-foot area within Bellevue Base bus yard and eastern employee parking lot (Figure 2). The project site is in Section 28, Township 25N, Range 5E; central coordinates 47.625901°, -122.172798°. The King County Metro property parcel number is 2825059295. The project site is in a highly developed setting, with a Republic Services garbage collection to the east, Public Storage to the north, and 124th Avenue NE west of the site entrance. The West Tributary runs from northwest to southeast along the western and southern boundaries of the project site along with an associated freshwater emergent wetland.

4.1.2 Critical Area Study Extent

The critical area study extent focused on the project site, as defined above, and the potential critical areas immediately adjacent to the project site (study area; Figure 2). Four potential critical areas were identified during initial project desktop assessment, including the West Tributary and associated wetland to the west and to the south, steep slopes also to the west and to the south of the project site, and a small depressional wetland swale immediately north of the bus entry. During desktop assessment, no critical areas were identified along the east or northeast boundaries; however, these areas were still surveyed during fieldwork to confirm absence or presence of critical areas; results are presented in Section 4.2.4, *Steep Slopes*, and Section 4.3, *Wetland and Stream Delineation Results*.

4.2 Desktop Assessment Results

4.2.1 U.S. Geological Survey Topographic Map

The West Tributary is mapped as a blue line feature at the bottom of the 7.5-minute USGS Kirkland topographic map (USGS 2017a). This feature continues in the 2017 7.5- minute USGS Mercer Island topographic map (USGS 2017b) flowing south into Kelsey Creek, which drains west into Mercer Slough and then into Lake Washington, a Traditional Navigable Waterway.

King County Metro



Figure 1. Bellevue Base Project Vicinity

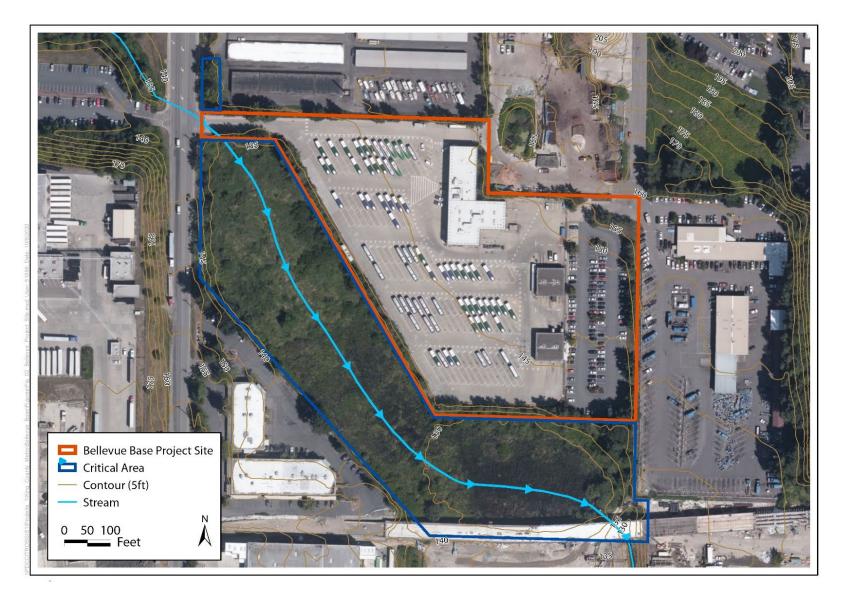


Figure 2. Bellevue Base Project Site and Adjacent Critical Areas

4.2.2 Hydrology

The project site is in the Cedar-Sammamish Watershed (Water Resource Inventory Area [WRIA] 8, hydrologic unit code [HUC] 17110012) (King County 2020). Historically, this area was almost entirely valley bottom forests with associated floodplain wetland (Collins et al. 2003). Currently, the Kelsey watershed subbasin is largely developed, with 12% remaining as forested and less than 2% wetland remaining (King County 2018).

The principal hydrological driver within the area is precipitation that drains into the West Tributary and associated wetland from surface or groundwater pathways. Several culverts draining into the wetland from the west and east were noted, along with a temporary stormwater construction drainage observed and associated with the Sound Transit light rail construction off of 124th Avenue NE (Appendix G). Large storm events result in the tributary overtopping and flooding the surrounding wetland. Runoff from these storm events is likely magnified due to the high concentration of hard surfaces surrounding the creek (USGS 2012). Prior to the field survey, precipitation was drier the previous 3 months when compared to historical conditions. However, there was precipitation 4 days prior to the field survey, so hydrological indicators were expected to be apparent (Appendix F).

The project site is outside of the 100-year floodplain based on the Federal Emergency Management Agency (1995) *Flood Insurance Rate Map for King County Washington Incorporated Areas*.

4.2.3 Natural Resources Conservation Soil Survey

The project site has two mapped soil units (Appendix B, Figure A). Soil Unit Sk, Seattle Muck, is mapped in the northwest portion of the project site. This soil is found in depressions and formed from grassy organic material. It is frequently flooded, poorly drained, and considered hydric. The remainder of the project site is mapped as EvC, Everett very gravelly sandy loam, 8% to 15% slopes. This soil is formed from sandy or gravelly glacial outwash and is typically located along foot slopes or shoulders. It is not flooded and is excessively drained; it is not considered hydric.

4.2.4 Steep Slopes

A steep slope was observed along the southern and western boundaries of the project site. No other inclines meeting the City of Bellevue's definition for steep slopes were observed within or immediately adjacent to the project site during the field visit. The southwestern area, as well as portions along northern and northeastern boundaries, were documented in the City of Bellevue Critical Geologic Hazards Map (City of Bellevue 2018b). However, no slope stability issues or landslide hazards were identified in King County iMap (King County 2020). In addition, the south, west, and northeast boundaries were not identified as a steep slope (greater than 40%) in the 1994 Bellevue Base Expansion Project NEPA Documented Categorical Exclusion report (King County Metro 1994: Exhibit C). The report notes that the general area's topography is largely due to cut-and-fill grading activities during initial development. A 2020 Critical Area Evaluation and Geotechnical Recommendations Yard Lighting Replacement for King County Metro Bellevue Base memo by the Riley Group (2020), a licensed technical geologist, noted the southern and western slopes, adjacent to the wetland, were likely fill slopes. In addition, the report concluded the slopes appeared stable with no signs of "previous settlement or failure" (Appendix I, The Riley Group Geotechnical Report). Possible

impacts from the project and mitigation measures for steep slopes are discussed in Chapter 5, *Impacts and Mitigation Assessment*.

4.2.4.1 Required Buffers and Structural Setback

Based on City of Bellevue Ordinance Codes discussed in Chapter 2, *Regulatory Framework*, a 50-foot buffer from top of slope is required along the western and southern boundaries of the project site (Figure 3). This buffer is entirely contained within the Bellevue Base bus parking area. As described immediately above, this area has been cut and filled but has also been shown to be stable with no historical evidence of landslides or other geologic instabilities. These buffers are likely to be eligible for exclusion, since the Bellevue Base Yard was initially built in 1983 (LUC 20.25H.095.D.1.b).

4.2.5 Wetland and Stream Inventories

The NWI maps the wetland associated with the West Tributary as a seasonally flooded forested wetland in the western portion and a permanently flooded aquatic bed pond in the eastern portion (Appendix B, Figure B; USFWS 2019). The *Bellevue Base Expansion Project NEPA Documented Categorical Exclusion* documented an isolated depressional wetland immediately north of the bus entry, parallel to 124th Ave NE (King County Metro 1994). The City of Bellevue maps the West Tributary as a stream in its GIS Streams shapefile (City of Bellevue 2018a). A *West Tributary Habitat Assessment* by Tetra Tech (2016) for the City of Bellevue determined the tributary was an F-type, or fish bearing, for the entire reach. King County iMap (King County 2020) also documents the West Tributary immediately west and south of the project site.

4.2.6 Fish and Wildlife Habitat

The WDFW Priority Habitats and Species map documents resident coastal cutthroat (*Oncorhynchus clarki*) occurring within and migrating through the site (Appendix B, Figure D; WDFW 2020a). WDFW SalmonScape also mapped Chinook (*Oncorhynchus tshawytscha*), coho (*Oncorhynchus kisutch*), and steelhead (*Oncorhynchus mykiss*) gradient accessible habitat in the West Tributary (Appendix B, Figure E; WDFW 2020b).² Although the Tetra Tech (2016) *West Tributary Habitat Assessment* also determined the tributary to be appropriate fish habitat, it additionally stated that there was no spawning habitat along the project reach and that habitat quality suffered from a dense reed canary grass (*Phalaris arundinacea*). The report recommended revegetation with a mix of native trees, shrubs, and herbaceous species along with wood placement to improve habitat (Tetra Tech 2016). Finally, Ecology's *Puget Sound Watershed Characterization Project* notes the watershed basin is important for local salmonid habitat but has poor quality wetland, floodplain, and terrestrial habitats for other wildlife (Appendix B, Figure F; Ecology 2019).

At the time of the field survey, northern flicker (*Colaptes auratus*), Anna's hummingbird (*Calypte anna*), marsh wren (*Cistothorus palustris*), song sparrow (*Melospiza melodia*), downy woodpecker (*Dryobates pubescens*), American goldfinch (*Spinus tristis*), golden-crowned kinglet (*Regulus satrapa*), cedar waxwing (*Bombycilla cedrorum*), red-winged blackbird (*Agelaius phoeniceus*), great blue heron (*Ardea herodias*), American crow (*Corvus brachyrhynchos*), and Virginia rail (*Rallus limicola*) were either seen or heard within the wetland complex. Plant diversity was good, with 35 different plant species observed, most in the herb layer and an equal number of tree and shrub

King County Metro Bellevue Base Next Generation Wireless (NGW) Project, Wetland Delineation and Critical Area Report

² Though Appendix B, Figure E is showing the range for Spring Chinook, this range is identical for winter and summer steelhead, coho, and summer chinook.

species (Appendix H). Of the 35 species, 9 are considered Class C noxious weeds or weeds of concern by King County. In addition, purple loosestrife (*Lysimachia vulgaris*), a Class B noxious weed, was observed during ICF fieldwork and mapped by King County on August 8, 2020 (King County 2020). Finally, according to the Washington Natural Heritage Program (DNR 2020), no threatened or endangered plant species are documented within or near the site.

Outside of the wetland complex and steep slope, the project site is completely paved, with small wash and fuel buildings and a larger administrative building on site. In summary, although the West Tributary and associated wetland complex provide some fish, aquatic, and wildlife habitat, the overall project site habitat potential is low because it is largely developed and used for bus parking.

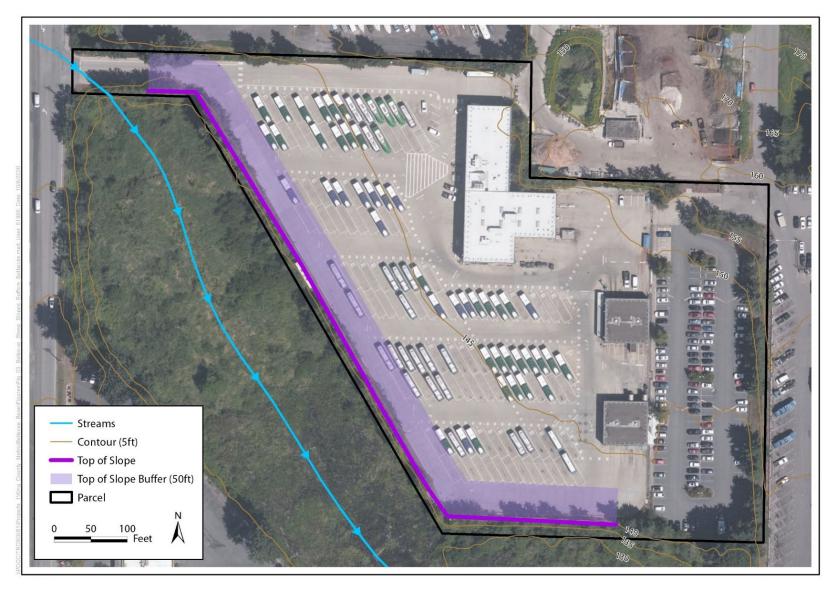


Figure 3. Steep Slopes and Associated Buffers and Setbacks

4.3 Wetland and Stream Delineation Results

The study area was surveyed September 22, 2020. Two wetlands were identified, and the West Tributary OHWM determined. Figure 4 shows the delineated wetland, West Tributary OHWM, and all sample locations (Appendices C and D).

4.3.1 Wetland Complex BB1, PSS1C, and PABH (5.63 acres)

A hydrologically connected, seasonally flooded freshwater scrub-shrub wetland and permanently flooded aquatic bed pond were identified in the study area. The riverine wetland boundary is defined by the toe of slope along the northern wetland boundary. The western portion of the ponded feature is also defined by the north toe of slope, which becomes less steep to the east where a large upland bench is present, followed by a steep slope, and then King County Metro employee parking lot. Since these wetland features are hydrologically and spatially connected—water flowing northwest to southeast through both—they are treated as one wetland complex (Hruby 2014).

4.3.1.1 Vegetation

There is one vegetative community in the wetland complex. The vegetative community has an herb layer dominated by reed canary grass (FACW) and broadleaf cattails (*Typha latifolia*, OBL) with willow thickets (*Salix* sp.) scattered throughout. The wetland and aquatic bed pond boundaries were dominated by reed canary grass in the herb layer, Himalayan blackberries in the shrub layer at the toe of slope, and Pacific willow (*Salix lucida* ssp. *Lasiandra*, FACW) and western red cedar (*Thuja plicata*, FAC) in the tree layer.



Figure 4. West Tributary OHWM Determination, Wetland Delineation, and Sample Plots

Herbs observed, but not dominant, in the western emergent wetland included field horsetail (*Equisetum arvense*, FAC), water parsley (*Oenanthe javanica*, OBL), creeping buttercup (*Ranunculus repens*, FAC), and large leaf avens (*Geum macrophyllum*, FAC), with Indian plum (*Oemleria cerasiformis*, FACU), salmonberry (*Rubus spectabilis*, FAC), and Douglas' meadowsweet (*Spiraea douglasii*, FACW) observed in the shrub layer. Red osier dogwood (*Cornus alba*, FACW) and nootka rose (*Rosa nutkana*, FAC) were noted near the aquatic bed pond boundary with slough sedge (*Carex obnupta*, OBL) and common monkeyflower (*Mimulus guttas* spp. *Guttas*, OBL) in the aquatic bed. Redwood and big leaf maple were noted in the tree layer in the study area.

This plant community meets the Corps' criteria for hydrophytic vegetation based on the dominance test.

4.3.1.2 Soils

The emergent wetland was composed of black silt loam (10YR 2/1) in the top 5 inches below ground surface (bgs) with gleyed, gray to dark gray (5/N and 4/N) sandy to silt soil beneath (BB-4 and BB-6, Loamy Gleyed Matrix [F2] indicator). A redox concentration along root pore linings was also noted in plot BB-4, while hydrogen sulfur odor was noted in BB-6 (A4 hydric indicator). BB-8, at the boundary of the aquatic bed pond, had very dark gray mucky sand (7.5YR 3/1, Sandy Mucky Mineral [S1] indicator) up to 7 inches bgs with very dark gray sand beneath (5Y 3/1). A hydrogen sulfur odor was also noted within this soil pit. These soils meet the hydric soil indicator requirements and the Corps' criteria for wetland soils.

4.3.1.3 Hydrology

Hydrology in the wetland is unidirectional and primarily driven through precipitation. Storm events cause the West Tributary to overtop onto the emergent wetland and flow into the aquatic bed pond. This water then flows downstream into the West Tributary as surface water or groundwater.

A high water table of 8 inches bgs or less was observed in soil pits BB-4 and BB-8. Surface water was observed within BB-6 and close to BB-8. These are both primary hydrological indicators and meet the Corps' criteria for wetland hydrology.

4.3.1.4 Adjacent Uplands

The adjacent upland area was above toe of slope at the base of a steep hillside. Vegetation was dominated by western red cedar in the tree layer, Himalayan blackberry in the shrub layer, and reed canary grass and hedge false bindweed (*Calystegia sepium*, FAC) in the understory. Hazelnut (*Corylus cornuta*, FACU) and English holly (*Ilex aquifolium*, FACU) were also observed in the shrub layer with English ivy (*Hedera helix*, FACU) in the herb layer. This plant community meets the Corps' criteria for hydrophytic vegetation based on the dominance test. BB-3 had very dark grayish (10YR 3/2) sandy loam with dense roots. BB-5 had black (10YR 2/1) silt loam in the top 8 inches bgs, followed by very dark gray to gray (7.5YR 3/1 and 7.5YR 5/1) silt loam, with some redox concentrations in the matrix. BB-7 had very dark gray silt loam up to 10 inches bgs, followed by dark gray sand (5YR 4/1). None of these soil pits had hydric soil indicators or met the Corps' criteria for

wetland soils. No surface water, high groundwater table, saturation, or any other primary hydrological indicators were observed in upland plots.

4.3.1.5 Functional Assessment

The wetland function of the BB1 wetland complex was assessed to determine appropriate buffers and setbacks under City of Bellevue Ordinance Codes (Section 4.3.3.1, *Required Buffers and Structural Setbacks*).

Water Quality and Hydrology

The wetland complex is a large, bowled area with dense vegetation so it can slow and store a large amount of water. Based on the 1994 *Bellevue Base Expansion Project NEPA Documented Categorical Exclusion* report, the wetland complex is important for stormwater storage and is designated as one of the City of Bellevue's stormwater detention ponds (King County Metro 1994). This was supported by the number of culverts observed along the wetland perimeter (Appendix G). In addition, though there are no water quality issues in the project vicinity, this wetland is still likely to improve water quality by allowing contaminants common in urban stormwater runoff to settle out of the water column, improving water quality downstream.

Habitat

Although the wetland unit has a good amount of plant diversity and special habitat features, it is also dominated by invasive plant species and isolated in a highly developed setting, so it has limited ability to provide quality habitat within a landscape setting, resulting in a moderate value to society.

Summary

The wetland unit was found to be a Category II due to its large size and moderate to high level of function within an isolated and disturbed setting. The wetland rating summary calculation is provided below.

```
Improving Water Quality – 6
Hydrologic – 9
<u>Habitat – 6</u>
Total – 21
```

4.3.2 Wetland Unit BB2, PFO1C (0.02 acre)

A roadside swale immediately north of Bellevue Base was identified as a seasonally flooded freshwater broad-leafed deciduous forest wetland in the study area. The forest wetland boundary is defined by the toe of slope along its western boundary. This depressional wetland is fed by stormwater runoff, which flows into a culvert at the south end and then into the BB1 wetland complex. Since this wetland is hydrologically independent of Wetland BB1, it was not considered as part of that complex (King County Metro 1994: Exhibit C; Hruby 2014).

4.3.2.1 Vegetation

There is one vegetative community in the wetland unit. The vegetative community was dominated by an ornamental maple tree (*Acer* sp., FAC) and lodgepole pine (*Pinus contorta*, FAC) in the tree

layer, sitka willow (*Salix sitchensis*, FACW) and a California laurel (FAC) in the shrub stratum, and reed canary grass in the herb layer. This plant community meets the Corps' criteria for hydrophytic vegetation based on the dominance test.

4.3.2.2 Soils

The wetland consisted of black to very dark gray sandy loam to a depth of 15 inches bgs (10YR 2/1 to 7.5YR 3/1). A hydrogen sulfur odor was noted (A4 hydric indicator), and the soil meets the Corps' criteria for wetland soils.

4.3.2.3 Hydrology

Hydrology in the wetland is unidirectional and primarily driven through precipitation. Storm events cause stormwater to flow into the depression wetland from the road and storage facility and flow into stormwater catchment and then into Wetland BB1.

A high water table of 11 inches was observed, with saturation at 9 inches bgs in soil pits. Surface water was observed immediately west of the sample plot. These are both primary hydrological indicators and meet the Corps' criteria for wetland hydrology.

4.3.2.4 Adjacent Uplands

The adjacent upland area was above toe of slope of a steep hillside. Vegetation was dominated by identical species as the wetland vegetative community. This plant community meets the Corps' criteria for hydrophytic vegetation based on the dominance test. Soil pit BB-1 had very dark brown (10YR 2/2) sandy loam throughout the profile, with dense roots in the top 5 inches bgs. No hydric soil indicators or Corps' criteria for wetland soils were met. No surface water, high groundwater table, saturation, or any other primary hydrological indicators were observed in the upland plot.

4.3.2.5 Functional Assessment

The wetland function of Wetland BB2 was assessed in order to determine appropriate buffers and setbacks under City of Bellevue Ordinance Codes (Section 4.3.3.1, *Required Buffers and Structural Setbacks*).

Water Quality and Hydrology

The small wetland unit has dense vegetation within a roadside swale in a highly developed setting. Based on the setting, the wetland has the potential to improve water quality and reduce flooding and erosion in an urban area. However, given the small area, wetland water storage potential is low. In addition, there is no flooding or pollutant problems in the project vicinity, so the value to society is also low.

Habitat

This small wetland is isolated, with paved surfaces immediately adjacent on all sides. Hydrology is driven through stormwater runoff and is not connected to a waterway or riparian corridor. Given the size, isolation, and setting in a highly developed area, the wetland has little ability and potential to provide wildlife habitat.

Summary

The wetland unit was found to be a Category IV due to its moderate to low level of function within an isolated and disturbed setting. The wetland rating summary calculation is provided below.

Improving Water Quality – 6 Hydrologic – 5 <u>Habitat – 4</u> **Total** – 15

4.3.2.6 Required Buffers and Structural Setback

Based on City of Bellevue Ordinance Codes discussed in Chapter 2, *Regulatory Framework*, a Category II wetland, Wetland BB1, with a habitat score of 6 is required to have a 110-foot buffer, with an additional 20-foot structural setback. A Category IV wetland, Wetland BB2, is required to have a 40-foot buffer with no structural setback. Given Bellevue Base was established in 1983, these requirements may exclude the existing footprint. However, any new development or construction must adhere to or mitigate for impacts in these areas. Full buffer extent is shown in Figure 5. The Wetland BB1 buffer contains a narrow vegetated hillside surrounding the wetland, but, outside of this, the area is largely in paved or developed areas with Bellevue Base bus parking area to the north, light rail construction to the south, 124th Avenue NE to the west, and Republic Services garbage collection parking lot to the east. As a result, the buffer provides minimal protection or functional lift in terms of wetland habitat, water quality improvement, or hydrology. Similarly, the Wetland BB2 buffer is almost entirely within paved areas, with 124th Avenue NE to the west, Bellevue Base driveway to the south, and public storage to the north and east.

4.3.3 West Tributary to Kelsey Creek (922 linear feet)

The West Tributary to Kelsey Creek appeared to have a sandy channel bottom ranging from 3 to 5 feet wide through the project site. The channel appeared to be incised with OHWM located at the top of the incised channel banks and flooding spilling over onto the large, flat BB1 wetland complex. OHWM was determined by undeveloped soil profiles, incised banks, and lack of vegetation below OHWM (OHMW-1, Appendix D).

4.3.3.1 Required Buffers and Structural Setbacks

Based on City of Bellevue Ordinance Codes discussed in Chapter 2, *Regulatory Framework*, all new construction on developed or undeveloped areas along the West Tributary in the Kelsey Creek basin is required to have a 50-foot buffer from the top of bank, with an additional 20-foot structural setback from the buffer (Figure 6). As part of the permitting process, any development within these areas must mitigate for possible impacts from the project. This buffer lays entirely within the Bellevue Base bus parking area and provides minimal wildlife habitat or hydrological improvements to the West Tributary to Kelsey Creek.



Figure 5. Wetland and Associated Buffers and Setbacks

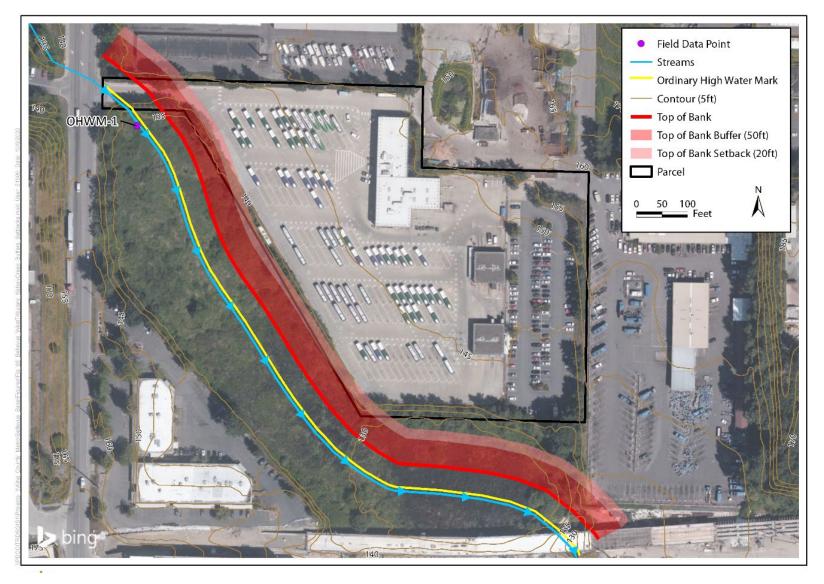


Figure 6. West Tributary to Kelsey Creek and Associated Buffers and Structural Setbacks

4.4 Limitations

The results and conclusions expressed herein represent ICF's professional judgment based on the information available; no other warranty, expressed or implied, is made. Final determinations for wetland boundaries and categories are the responsibility of the regulating resource agencies. Wetland boundaries can be altered by changes in land use, hydrology, or climate. If a physical change occurs in the basin, or if 3 to 5 years pass before the project is constructed, another wetland delineation should be conducted.

5.1 Temporary Impacts

No temporary filling, dredging, or discharge into the West Tributary or associated wetland would occur as part of project construction. The project is designed to avoid any work below the OHWM of the West Tributary. No in-water work or work within the wetland footprint for the Wetland BB1 complex or Wetland BB2 unit is required or would occur. Temporary impacts would include excavation for:

- 1. Four entry and exit soil pits for directional boring, measuring approximately 6 feet long by 3 feet wide by 3 feet deep.
- 2. Directional boring, between 24 and 36 inches below grade, along the western boundary.
- 3. One trench, measuring approximately 54 feet long by 8 inches wide by 24 inches deep, running from the southwest vault to the nearest Type 1 junction boxes to the northwest, and to an exit boring pit to the southeast. This trenching would be completed on top of the planned directional boring.
- 4. Four trenches, measuring 5 feet long by 0.8 foot wide by 2 feet deep, running from Type 1 junction boxes to two light pole foundations (light pole supporting AP10 and AP11 and light pole supporting AP9).
- 5. Twelve Type 1 junction boxes, measuring 22 inches long by 17 inches wide by 12 inches deep.
- 6. Eleven conduit supports, measuring 6 inches long by 12 inches wide by 6 inches deep.

At a minimum, approximately 161.5 square feet of ground surface area and approximately 656.75 cubic feet of soil/ground materials would be disturbed to install new conduits, conduit supports, and junction boxes.

Directional boring would require water, which would come from the buildings on site, and all slurry material as a result of directional boring would be collected, contained in a closed vessel and disposed of at a permitted off-site location.

Ground disturbance activity is likely within the top of steep slopes, wetland buffers, and top of bank setbacks. See Figure 7 for ground disturbance locations in relation to critical area boundaries, buffers, and setbacks. This figure assumes the Bellevue Base, built in the 1980s, qualifies for a wetland and steep slope exclusion of buffers and setbacks from the perimeter cement curb inward toward the established bus parking area and operations and maintenance building (LUC 20.25H.095.D.1.b and LUC 20.25H.120.B.2, respectively).

During construction, clearing, grading, excavating, soil stockpiling, and other construction activities that temporarily remove vegetation, reduce soil stability, or increase soil erosion could occur. Soil disturbance due to trenching, conduit boring soil pits, junction box and conduit support installations would also occur. Soil disturbance would occur on a slight slope within fill material. Best management practices and temporary erosion sediment control (TESC) measures would be

implemented. Lay-down construction zones would be kept to the paved parking area. All demolition debris would be taken off site and disposed of at a permitted facility.

Groundwater may be encountered during junction box and conduit support installations or directional boring and trenching. There is a potential risk groundwater quality may be impaired due to release or exposure to gasoline, oil, hydraulic fluids, and related materials from use and operation of construction equipment. However, during construction, this risk would be mitigated, as any encountered groundwater or stormwater would be collected, pumped to a 55-gallon (mininum) drum and allowed for the particulates to settle out prior to discharge into the existing storm conveyance system.

Fugitive dust emissions may also occur due to clearing, excavating, and other construction activities. Potential for fugitive dust emissions would be higher during dry, warm weather conditions when wind and construction equipment create more dust.

Emissions from construction vehicles and equipment may temporarily affect local air quality during construction of the project. The emissions quantities have not been estimated; however, they are not expected to exceed local emissions standards.

King County Metro Impacts and Mitigation Assessment

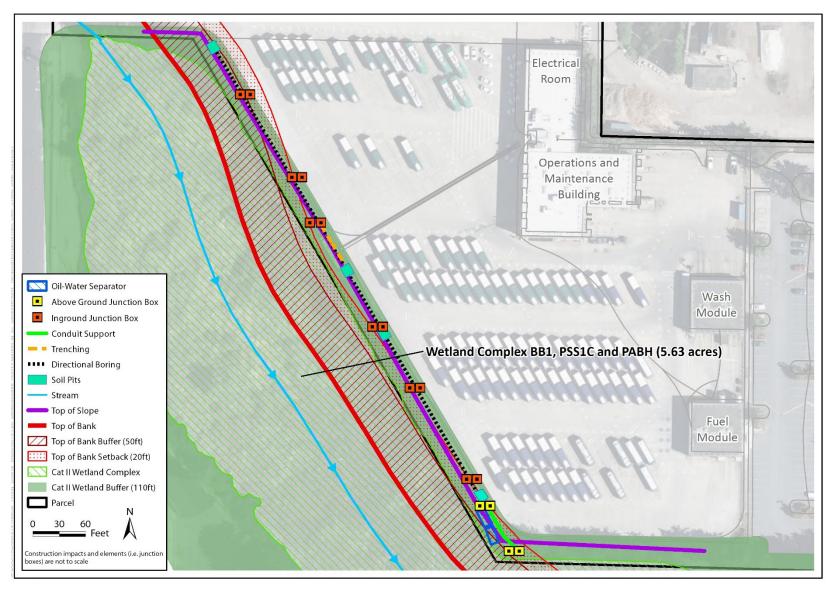


Figure 7. Temporary Impacts during Construction (With Buffer and Setback Exclusions)

5.2 Permanent Impacts

During operations, WAPs would not affect air quality or create emissions. Vehicular emissions would also not increase during the operation of the project. Operation of new WAPs would not result in any permanent filling, dredging, or discharge into the West Tributary or associated wetland. The project would remain above OHWM and outside of top of bank. The project would remain outside of Wetland BB2 and associated buffer and setback. New junction boxes and conduit supports would be within the top of steep slopes and BB1 wetland buffer and top of bank setback. See Figure 8 for location of new aboveground structure locations in relation to critical area boundaries, buffers, and setbacks. Based on this information, the project would require modification to the application of the City of Bellevue Critical Area Ordinance code to this project, per the following.

- LUC 20.25H.075.C.1.c: Designation of Critical Areas and Buffers, Streams, West Tributary, Kelsey Basin. General performance standards outlined in LUC 20.25H.080 would be followed. Mitigation through avoidance and minimization of impacts on the West Tributary would be accomplished by design measures discussed in Section 5.3, Mitigation Measures (LUC 20.25H.085). In addition, the required setback for open waterways may be modified within developed areas if shown the project would not impact stream function or habitat (LUC 20.25H.075.D.4).
- LUC 20.25H.095.D.1.b: Designation of Critical Areas and Buffers, Wetlands, Buffers, and Setbacks on Sites with Existing Development. Buffer averaging was considered but found not to be possible since it would need a 75% or greater width reduction of the required buffer dimensions (LUC 2025H.095.D.2.a.vii). However, performance standards outlined in LUC 20.25H.100 would be followed and implemented. Additionally, mitigation through minimization of impacts on the wetland adjacent to the project site would be accomplished through design measures discussed for LUC 20.25H.105.
- LUC 20.25H.120.A.2: Designation of Critical Areas and Buffers, Geologic Hazard, Steep Slopes. Performance standards outlined in LUC 20.25H.125 would be followed and are discussed in further detail below. Additionally, a geotechnical evaluation has been completed by a licensed engineer and geologist to determine potential impacts from the project prior to finalizing construction plans (LUC 20.25H.145). The report concluded the project should be exempt from critical area requirements.

King County Metro Impacts and Mitigation Assessment

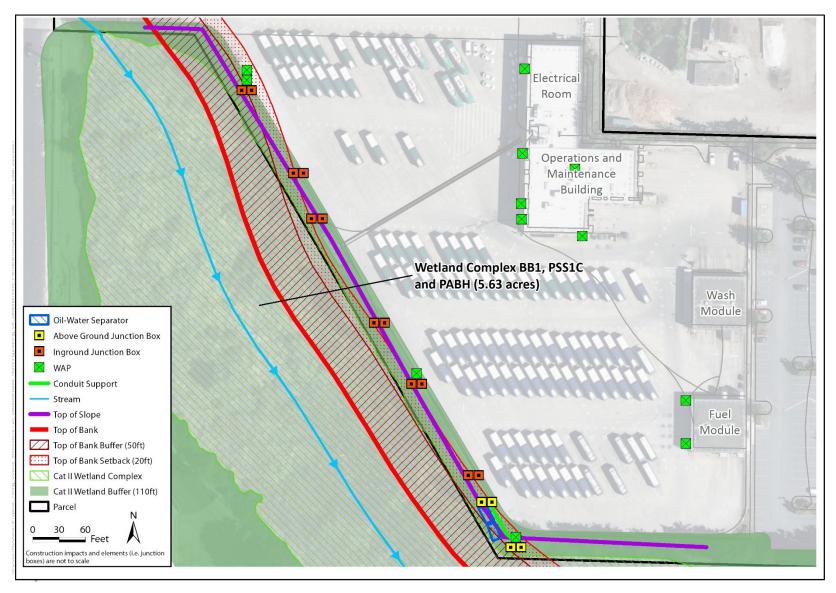


Figure 8. Permanent Impacts (With Buffer and Setback Exclusions)

5.2.1 New Permanent Structures

New inground and aboveground structures, the 12 new inground junction boxes and the 11 new conduit supports, which accommodate and connect conduits to the 4 new aboveground junction boxes, were considered as a permanent impact. The 4 new aboveground junction boxes would be attached to the new conduit supports and the existing light pole where AP8 would also be attached to at the southwest corner of Bellevue Base and would not touch the ground, and therefore the 4 aboveground junction boxes were not considered a permanent impact. Since the ground surface would be returned to the existing condition—the same elevation and contour as before soil pits were dug for directional boring or trenching—conduit installation was considered a temporary impact. WAPs would be mounted to structures, such as light poles or exterior walls, and therefore would not increase hard surfaces or otherwise impact critical areas. Along the western boundary, based on City of Bellevue designation for critical areas (20.25H), 12 new junction boxes and 11 new conduit supports, would be within the top of a steep slope (LUC 20.25H.120; City of Bellevue 2018b) and wetland buffer (LUC 20.25H. 095.D.1a). In addition, the new junction boxes and the new conduit supports would be within the top of bank setback for the West Tributary to Kelsey Creek (LUC 20.25H.075). Dimensions of the 12 Type 1 junction boxes and 11 conduit supports were provided in Section 1.2, Project Description, and again in Section 5.1, Temporary Impacts. These new inground permanent structures would replace bare ground or weedy species, such as Himalayan blackberry, English ivy, or St. John's wort. This would increase the hard surfaces within the project site by 37.5 square feet or 0.01% of the total project site. This increase in hard surfaces may reduce water infiltration and increase stormwater runoff in the area. However, the overall increased area is minimal in comparison to the remainder of the project site as well as when compared to the surrounding area, which is highly developed. Therefore, the new permanent structures are not expected to result in a noticeable change to the current existing site conditions.

The new permanent structures would be compliant with City of Bellevue performance standards (LUC 20.25H.080.A, LUC 20.25H.100, and LUC 20.25H.125). The most applicable of these standards is the standard for steep slopes (LUC 20.25H.125). Specifically, all new junction boxes and conduit supports would minimize alteration of the natural slope contour and would work to preserve the natural landform (LUC 20.25H.125.A and B). In addition, as mentioned in Section 4.2.4, *Steep Slopes*, the project underwent a geotechnical evaluation by an engineer and geologist licensed in Washington State, who determined the earthwork was minor and would not result in adverse effects due to construction or operation of the project and, therefore, should be exempt from critical area requirements (LUC 20.25H.145; Appendix I).

The new permanent structures within the wetland buffer would be surrounded and would replace weedy species such as Himalayan blackberries, St. John's wort, or bare ground, which have low habitat potential. These buffer functions are unlikely to be affected by the new permanent structure and improve or change over the life of the project.

Similarly, the new permanent structures within the top of bank for the West Tributary to Kelsey Creek setback are surrounded by weedy species at the top of a slope, which provides little to no riparian or aquatic habitat, hydrological protection, or benefit to the waterway. The new permanent structures would have little or no impact on the West Tributary to Kelsey Creek.

5.2.2 Cumulative Impacts

Per LUC 20.25H.250.B.4, cumulative impacts from the project were considered. The project would have minimal impacts on steep slopes, the West Tributary to Kelsey Creek, and the associated wetland due to new aboveground structures. The new aboveground structures would be relatively small and would not increase total hard surfaces in comparison to the remainder of the project site and surrounding area, which are highly developed and consist mainly of impervious surfaces.

5.2.3 Impacts on Critical Area Buffers and Setbacks

Currently, the West Tributary to Kelsey Creek buffers and setbacks are fully contained within the Bellevue Base bus parking area. This paved surface does not provide any habitat or hydrological protection or benefit to the waterway. Similarly, the wetland buffer is largely within a highly developed setting, providing minimal protection or functional lift for wetland habitat, hydrology, or water quality. The wetland buffer for Wetland Complex BB1 within the construction area is composed of weedy species at the top of a slope, resulting in low water storage or habitat potential. The wetland buffer for Wetland BB2 within the construction area is composed of a landscaping strip comprised of mulch and ornamental trees. In addition, construction and operation of the project would occur within areas of the wetland buffers that have previously been developed with the existing underground conduits. These buffer functions are unlikely to improve or change over the life of the project. While project operation would not greatly improve the riparian corridor, there would be little to no project impacts from the new permanent structures, due to application of performance standards discussed above.

Although steep slope buffers are likely to be excluded based on LUC 20.25H.120.B.2, the 50-foot buffer is fully contained within the Bellevue Base parking lot. This paved area is level and historically has been stable with no reported landslides, slumping, or other geologic instability. Figures 9 and 10 overlay all applicable buffers and setbacks over the temporary and permanent project elements, without exclusions.

King County Metro Impacts and Mitigation Assessment

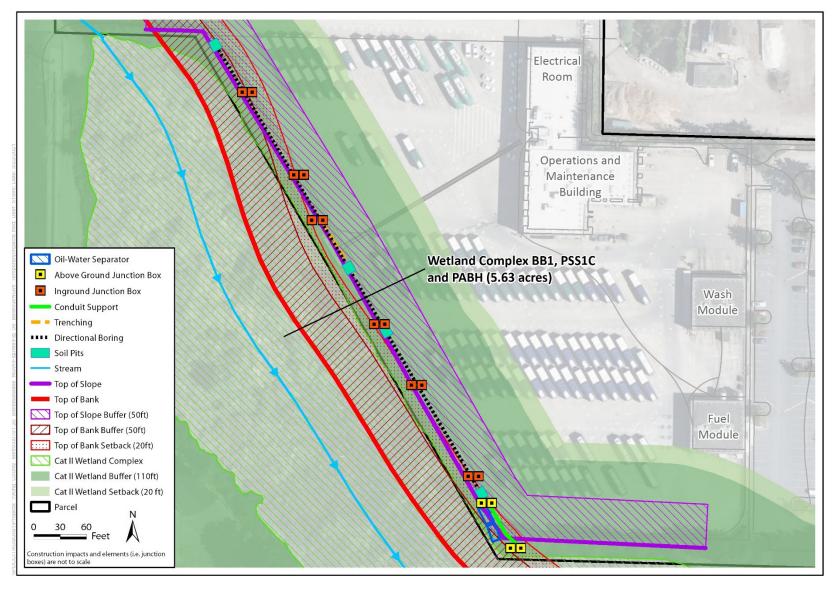


Figure 9. Temporary Impacts during Construction (No Buffer and Setback Exclusions)

King County Metro Impacts and Mitigation Assessment

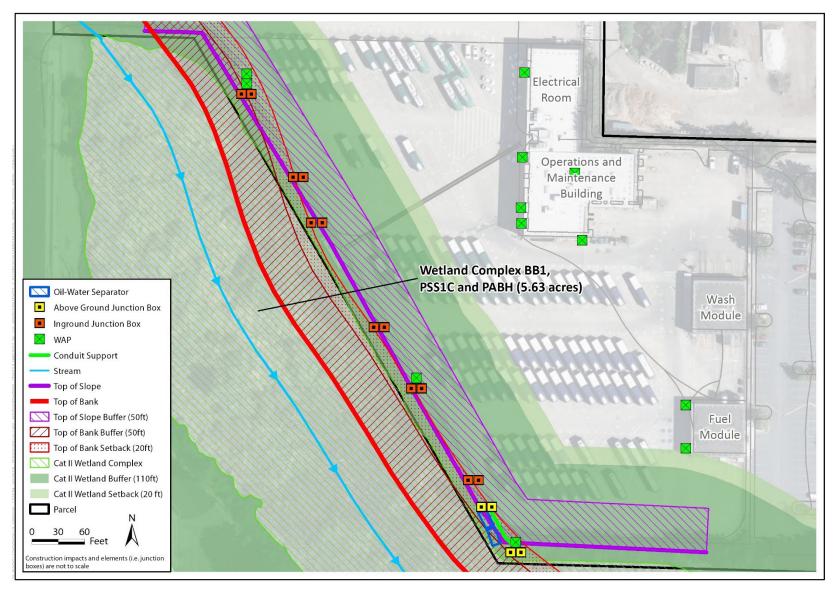


Figure 10. Permanent Impacts (No Buffer and Setback Exclusions)

5.3 Mitigation Measures

Potential impacts from construction and operation of the project were considered during the project design process. Any impacts that cannot be avoided, addressed by construction design, or minimized would require further mitigation.

5.3.1 Avoidance

Construction activities have been sited to avoid work in or around jurisdictional waters to protect existing resources and steep slopes.

5.3.2 Minimization

Construction techniques would be implemented to reduce possible impacts from construction on steep slopes. Ground disturbance due to trenching for conduits has been minimized as much as possible through use of directional conduit boring. A project-specific Stormwater Pollution Prevention Plan (SWPPP) would be prepared to reduce or control erosion that might otherwise occur during ground-disturbing activities. Best management practices and TESC identified in the SWPPP would be followed to control the risk of erosion. In addition, existing vegetation would be preserved to the extent practicable. Erosion control and SWPPP practices would also ensure no stormwater discharge or erosion into Wetland BB1, BB2, or the West Tributary to Kelsey Creek. The SWPPP would include a dewatering plan to address the risk of contaminating groundwater, if encountered.

The project construction would address and reduce air quality impacts by implementing such measures as covering loads, installing and maintaining construction area entrances and exits, and performing proper vehicle maintenance.

5.3.2.1 New Permanent Structures

Project placement of new junction boxes and conduit supports should be such that there is minimal to no increase of geologic hazards at the project site or in the surrounding area. The corresponding geotechnical report (Appendix I), per LUC 20.25H.145, investigated the impact of the project on slope stability along the southern, western, and northern boundaries. The report concluded slope stability would not be impacted by construction or operation of the project and should be exempt from critical area requirements. The report also listed minimization measures and recommendations to be incorporated into the final design drawings and construction specifications, such as an erosion and sediment control plan, and use of structural fill (Appendix I). For the siting of junction boxes and conduit supports, design measures included placing junction boxes and conduit supports within 5 feet of the existing bus yard curb line. The intent of placing new permanent structures within 5 feet of the existing bus yard curb line is to minimize the siting impact and keep the junction boxes and conduit supports as far away from the critical areas—West Tributary top of bank, Wetland BB1 Complex, and top of slope—as possible. In addition, the project should not alter the contour of any existing slopes on site, and contractors should return any disturbed areas to preconstruction conditions.

5.3.3 Available Mitigation Measures

If the City of Bellevue concludes project impacts are not fully mitigated by avoidance and design measures discussed in Section 5.3.1, *Avoidance*, and Section 5.3.2, *Minimization*, additional mitigation measures may be required for project permitting. This section provides a brief discussion of possible available mitigation measures. To best address project impacts, all proposed available mitigation measures would occur within the critical areas or associated buffers at the project site. No offsite mitigation is proposed.

5.3.3.1 New Permanent Structures

Placement of the 12 junction boxes and conduit supports within the top of slope, wetland buffer, and Kelsey Creek buffer or setback may require additional mitigation. Because the new structures would replace weedy species, which have low habitat potential, impact on, change to, or reduced function of the wetland buffer within the project site would be low. If required by the City of Bellevue for project permitting, possible wetland buffer mitigation could include removal of invasive species, such as Himalayan blackberry and English Ivy, along the wetland buffer in the project property. This removal would improve habitat in the wetland complex and riparian corridor. Impacts on the West Tributary to Kelsey Creek setback could also be mitigated through management of invasive species above the OHWM, which would improve riparian habitat.

5.3.3.2 Cumulative Gain from Available Mitigation Measures

Because all proposed available mitigation would be from vegetation enhancement, hydrology through the West Tributary and the associated wetland would largely function as it did before the project.

- Brinson, M. M. 1993. *A Hydrogeomorphic Classification for Wetlands.* Technical Report WRPDE4. August. Vicksburg, MS: U.S. Army Engineer Waterways Experiment Station.
- City of Bellevue. 2018a. *GIS Data Portal*. Available: https://bellevuewa.gov/city-government/departments/ITD/services/maps/g-i-s-data-portal. Accessed: October 6, 2020.
- City of Bellevue. 2018b. *Critical Areas Hazards Map, Geologic Hazards*. Available: https://www.arcgis.com/apps/MapSeries/index.html?appid=8a2e50c0ce6d473f93054798085f f30f. Accessed: October 6, 2020.
- City of Bellevue. 2019. *Critical Areas Land Use Permit.* Available: https://bellevuewa.gov/city-government/departments/development/permits/land-use-permits/critical-areas-land-use-permit. Accessed: March 17, 2020.
- Collins, B. D., D. R. Montgomery, and A. J. Sheikh. 2003. *Reconstructing the Historical Riverine Landscape of the Puget Lowland*. Available: https://pdfs.semanticscholar.org/5d32/1ac2e6483788a464ddd0bc9725717ef7dc75.pdf?_ga=2. 236212290.2131284613.1587992964-1054833396.1587992964. Accessed: April 14, 2020.
- Cooke, S. S. 1997. *A Field Guide to the Common Wetland Plants of Western Washington and Northwest Oregon*. Seattle, WA: Seattle Audubon Society.
- Cowardin, L. M., C. Carter, F. C. Golet, and E. T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. FWS/OBS-78/31. Washington, D.C.: U.S. Department of the Interior, Fish and Wildlife Service, Office of Biological Services.
- Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1. Vicksburg, MS: U.S. Department of the Army, Corps of Engineers, Waterways Experiment Station.
- Environmental Laboratory. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0). J. S. Wakeley, R. W. Lichvar, and C. V. Noble (eds.). ERDC/EL TR-10-3. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
- Federal Emergency Management Agency. 1995. Flood Insurance Rate Map for King County Washington Incorporated Areas, Panel 368 of 1725. Map Number 53033C0368F. Effective May 16, 1995.
- Hitchcock, C. L., and A. Cronquist. 1973. *Flora of the Pacific Northwest*. Seattle, WA: University of Washington Press.
- Hruby, T. 2014. *Washington State Wetland Rating System for Western Washington—2014 Update.* Ecology Publication 14-06-029. Washington State Department of Ecology.
- King County. 2018. *Stream Report, Kelsey Creek 0444*. Available: https://green2.kingcounty.gov/streamsdata/watershedinfo.aspx?Locator=0444. Accessed: April 13, 2020.

King County Metro References

King County. 2020. *iMap Home*. Available: https://gismaps.kingcounty.gov/iMap/. Accessed: October 4, 2020.

- King County Metro. 1994. *Bellevue Base Expansion Project NEPA Documented Categorical Exclusion*. Prepared for the Federal Transit Administration.
- Lichvar, R. W., D. L. Banks, W. N. Kirchner, and N. C. Melvin. 2016. The National Wetland Plant List: 2016 Wetland Ratings. *Phytoneuron* 2016-30:1–17.
- Munsell Color Services. 2000. Munsell Soil Color Charts. New Windsor, NY: GretagMacbeth.
- National Water and Climate Center. 2020. *Climate Data Summary for WETS Station: Seattle Tacoma International Airport, WA*. U.S. Department of Agriculture, Natural Resources Conservation Service. Available: http://agacis.rcc-acis.org/. Accessed: September 29, 2020.
- Natural Resources Conservation Service (NRCS). 2018. *Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils, Version 8.2*. L. M. Vasilas, G. W. Hurt, and J. F. Berkowitz (eds.). In cooperation with the National Technical Committee for Hydric Soils.
- Natural Resources Conservation Service (NRCS). 2019. *Web Soil Survey*. Available: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed: October 4, 2020.
- Pojar, J., and A. Mackinnon. 2004. *Plants of the Pacific Northwest Coast: Washington, Oregon, British Columbia & Alaska*. Vancouver, BC: Lone Pine Publishing.
- Tetra Tech. 2016. *West Tributary Habitat Assessment.* Final Report. September. Prepared for City of Bellevue.
- The Riley Group. 2020. *Critical Area Evaluation and Geotechnical Recommendations Yard Lighting Replacement for King County Metro Bellevue Base.* Prepared for King County Metro.
- U.S. Army Corps of Engineers. 2007. *Regulatory guidance letter: Subject: Practices for documenting jurisdiction under Sections 9 & 10 of the Rivers & Harbors Act (RHA) of 1899 and Section 404 of the Clean Water Act (CWA)*. Available: https://usace.contentdm.oclc.org/digital/collection/p16021coll9/id/1279/rec/1. Accessed: January 7, 2021.
- U.S. Fish and Wildlife Service (USFWS). 2019. *National Wetland Inventory Mapper V2*. October 8, 2019. Available: https://www.fws.gov/wetlands/data/mapper.html. Accessed: October 4, 2020.
- U.S. Geological Survey (USGS). 2012. *Impervious Surfaces and Flooding.* Available: https://www.usgs.gov/special-topic/water-science-school/science/impervious-surfaces-and-flooding?qt-science_center_objects=0#qt-science_center_objects. Accessed: April 13, 2020.
- U.S. Geological Survey (USGS). 2017a. *Kirkland Quadrangle, King County, Washington 7.5-Minute Series*. Available: https://catalog.data.gov/dataset/usgs-us-topo-7-5-minute-map-for-kirkland-wa-2017e7f92. Accessed: April 13, 2020.
- U.S. Geological Survey (USGS). 2017b. *Mercer Island Quadrangle, King County, Washington 7.5-Minute Series*. Available: https://catalog.data.gov/dataset/usgs-us-topo-7-5-minute-map-for-mercerisland-wa-20176b01f/resource/d4cb4768-498c-4e16-9ba1-59595f4a92a7. Accessed: October 4, 2020.

King County Metro References

Washington Department of Fish and Wildlife (WDFW). 2020a. *Priority Habitats and Species: Maps.* PHS on the Web. Available: http://apps.wdfw.wa.gov/phsontheweb/. Accessed: October 4, 2020.

- Washington Department of Fish and Wildlife (WDFW). 2020b. *SalmonScape*. Available: https://apps.wdfw.wa.gov/salmonscape/. Accessed: October 6, 2020.
- Washington State Department of Ecology (Ecology). 2016. *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State*. Publication no. 16-06-029.
- Washington State Department of Ecology (Ecology). 2019. *Puget Sound Watershed Characterization Project*. Available: https://ecology.wa.gov/Water-Shorelines/Puget-Sound/Watershed-characterization-project. Accessed: October 6, 2020.
- Washington State Department of Natural Resources (DNR). 2020. Washington Natural Heritage Program Element Occurrences Current. Available: https://data-wadnr.opendata.arcgis.com/datasets/washington-natural-heritage-program-element-occurrences-current?geometry=122.199%2C47.625%2C-122.158%2C47.630. Accessed: October 6, 2020.